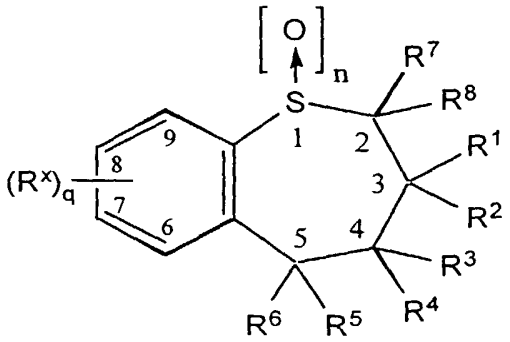
What is claimed is:

1. A compound of formula (I):



(I

wherein:

q is an integer from 1 to 4;

n is an integer from 0 to 2;

$R^1$ and $R^2$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkylamino, alkylthio, (polyalkyl)aryl, and cycloalkyl,

wherein alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkylamino, alkylthio, (polyalkyl)aryl, and cycloalkyl optionally are substituted with one or more substituents selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^+R^9R^{10}R^wA^-$, $SR^9$, $S^+R^9R^{10}A^-$. $P^+R^9R^{10}R^{11}A^-$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, $CO_2R^9$, CN, halogen, oxo, and $CONR^9R^{10}$,

wherein alkyl, alkenyl, alkynyl, alkylaryl, alkoxy, alkoxyalkyl, (polyalkyl)aryl, and cycloalkyl optionally have one or more carbons replaced by O, $NR^9$,

$N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $P^+R^9R^{10}A^-$, or phenylene,

wherein $R^9$, $R^{10}$, and $R^w$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, cycloalkyl, aryl, acyl, heterocycle, ammoniumalkyl, arylalkyl, and alkylammoniumalkyl; or

$R^1$ and $R^2$ taken together with the carbon to which they are attached form $C_3$-$C_{10}$ cycloalkyl;

$R^3$ and $R^4$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, acyloxy, aryl, heterocycle, $OR^9$, $NR^9R^{10}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, and $SO_3R^9$, wherein $R^9$ and $R^{10}$ are as defined above; or

$R^3$ and $R^4$ together form =O, $=NOR^{11}$, =S, $=NNR^{11}R^{12}$, $=NR^9$, or $=CR^{11}R^{12}$,

wherein $R^{11}$ and $R^{12}$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, aryl, arylalkyl, alkenylalkyl, alkynylalkyl, heterocycle, carboxyalkyl, carboalkoxyalkyl, cycloalkyl, cyanoalkyl, $OR^9$, $NR^9R^{10}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, $CO_2R^9$, CN, halogen, oxo, and $CONR^9R^{10}$, wherein $R^9$ and $R^{10}$ are as defined above, provided that both $R^3$ and $R^4$ cannot be OH, $NH_2$, and SH, or

$R^{11}$ and $R^{12}$ together with the nitrogen or carbon atom to which they are attached form a cyclic ring;

$R^5$ and $R^6$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, quaternary heterocycle, $OR^{30}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, and $SO_3R^9$,

wherein alkyl, alkenyl, alkynyl, aryl, cycloalkyl,

heterocycle, quaternary heterocycle, and quaternary heteroaryl can be substituted with one or more substituent groups independently selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary heteroaryl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R^{15}A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$,

wherein:

$A^-$ is a pharmaceutically acceptable anion and M is a pharmaceutically acceptable cation,

said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can be further substituted with one or more substituent groups selected from the group consisting of $OR^7$, $NR^7R^8$, $SR^7$, $S(O)R^7$, $SO_2R^7$, $SO_3R^7$, $CO_2R^7$, CN, oxo, $CONR^7R^8$, $N^+R^7R^8R^9A-$, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary heteroaryl, $P(O)R^7R^8$, $P^+R^7R^8R^9A^-$, and $P(O)(OR^7)OR^8$, and

wherein said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can optionally have one or more carbons replaced by O, $NR^7$, $N^+R^7R^8A-$, S, SO, $SO_2$, $S^+R^7A-$, $PR^7$, $P(O)R^7$, $P^+R^7R^8A-$, or phenylene, and $R^{13}$, $R^{14}$, and $R^{15}$ are independently selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, polyalkyl, aryl,

arylalkyl, cycloalkyl, heterocycle, heteroaryl, quaternary heterocycle, quaternary heteroaryl, and quaternary heteroarylalkyl,

wherein alkyl, alkenyl, alkynyl, arylalkyl, heterocycle, and polyalkyl optionally have one or more carbons replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $PR^9$, $P^+R^9R^{10}A^-$, $P(O)R^9$, phenylene, carbohydrate, amino acid, peptide, or polypeptide, and

$R^{13}$, $R^{14}$, and $R^{15}$ are optionally substituted with one or more groups selected from the group consisting of sulfoalkyl, quaternary heterocycle, quaternary heteroaryl, $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{10}R^{11}A^-$, $S^+R^9R^{10}A^-$, and $C(O)OM$,

wherein $R^{16}$ and $R^{17}$ are independently selected from the substituents constituting $R^9$ and M; or

$R^{14}$ and $R^{15}$, together with the nitrogen atom to which they are attached, form a cyclic ring; and

$R^{30}$ is selected from the group consisting of alkyl, alkenyl, alkynyl, cycloalkyl, aryl, acyl, heterocycle, ammoniumalkyl, alkylammoniumalkyl, and arylalkyl; and

$R^7$ and $R^8$ are independently selected from the group consisting of hydrogen and alkyl; and

one or more $R^x$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, polyalkyl, acyloxy, aryl, arylalkyl, halogen, haloalkyl, cycloalkyl, heterocycle, heteroaryl, polyether, quaternary heterocycle, quaternary heteroaryl, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $S(O)_2R^{13}$,

$SO_3R^{13}$, $S^+R^{13}R^{14}A^-$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, $C(O)NR^{13}R^{14}$, NR14C(O)R13, C(O)OM, $COR^{13}$, $OR^{18}$, $S(O)_nNR^{18}$, $NR^{13}R^{18}$, $NR^{18}OR^{14}$, $N^+R^9R^{11}R^{12}A^-$, $P^+R^9R^{11}R^{12}A^-$, amino acid, peptide, polypeptide, and carbohydrate,

wherein alkyl, alkenyl, alkynyl, cycloalkyl, aryl, polyalkyl, heterocycle, acyloxy, arylalkyl, haloalkyl, polyether, quaternary heterocycle, and quaternary heteroaryl can be further substituted with $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{11}R^{12}A^-$, $S^+R^9R^{10}A^-$, or C(O)OM, and

wherein $R^{18}$ is selected from the group consisting of acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heteroaryl, alkyl,

wherein acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heteroaryl, alkyl, quaternary heterocycle, and quaternary heteroaryl optionally are substituted with one or more substituents selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_3R^9$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, and C(O)OM,

wherein in $R^x$, one or more carbons are optionally replaced by O, $NR^{13}$, $N^+R^{13}R^{14}A^-$, S, SO, $SO_2$, $S^+R^{13}A^-$, $PR^{13}$, $P(O)R^{13}$, $P^+R^{13}R^{14}A^-$, phenylene, amino acid, peptide, polypeptide, carbohydrate, polyether, or polyalkyl,

wherein in said polyalkyl, phenylene, amino acid, peptide, polypeptide, and carbohydrate, one or more

carbons are optionally replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $PR^9$, $P^+R^9R^{10}A^-$, or $P(O)R^9$;

wherein quaternary heterocycle and quaternary heteroaryl are optionally substituted with one or more groups selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R^{15}A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$,

provided that both $R^5$ and $R^6$ cannot be hydrogen or SH;

provided that when $R^5$ or $R^6$ is phenyl, only one of $R^1$ or $R^2$ is H;

provided that when q = 1 and $R^x$ is styryl, anilido, or anilinocarbonyl, only one of $R^5$ or $R^6$ is alkyl; or

a pharmaceutically acceptable salt, solvate, or prodrug thereof.

2. A compound of claim 1, wherein $R^5$ and $R^6$ are independently selected from the group consisting of H, aryl, heterocycle, quaternary heterocycle, and quaternary heteroaryl,

wherein said aryl, heteroaryl, quaternary heterocycle, and quaternary heteroaryl can be substituted with one or more substituent groups

independently selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, C(O)OM, $COR^{13}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R^{15}A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$,

wherein said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can optionally have one or more carbons replaced by O, $NR^7$, $N^+R^7R^8A^-$, S, SO, $SO_2$, $S^+R^7A^-$, $PR^7$, $P(O)R^7$, $P^+R^7R^8A^-$, or phenylene,

wherein said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can be further substituted with one or more substituent groups selected from the group consisting of $OR^7$, $NR^7R^8$, $SR^7$, $S(O)R^7$, $SO_2R^7$, $SO_3R^7$, $CO_2R^7$, CN, oxo, $CONR^7R^8$, $N^+R^7R^8R^9A-$, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary heteroaryl, $P(O)R^7R^8$, $P^+R^7R^8A^-$, and $P(O)(OR^7)OR^8$.

3. A compound of claim 2, wherein $R^5$ or $R^6$ has the formula

$$-Ar-(R^y)_t$$

wherein:

t is an integer from 0 to 5;

Ar is selected from the group consisting of phenyl, thiophenyl, pyridyl, piperazinyl, piperonyl, pyrrolyl, naphthyl, furanyl, anthracenyl, quinolinyl, isoquinolinyl, quinoxalinyl, imidazolyl, pyrazolyl, oxazolyl, isoxazolyl, pyrimidinyl, thiazolyl, triazolyl, isothiazolyl, indolyl, benzoimidazolyl, benzoxazolyl, benzothiazolyl, and benzoisothiazolyl; and

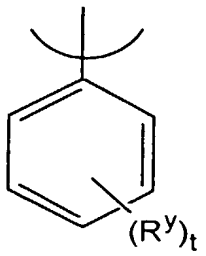
one or more $R^y$ are independently selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R^{15}A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$,

wherein said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can be further substituted with one or more substituent groups selected from the group consisting of $OR^7$, $NR^7R^8$, $SR^7$, $S(O)R^7$, $SO_2R^7$, $SO_3R^7$, $CO_2R^7$, CN, oxo, $CONR^7R^8$, $N^+R^7R^8R^9A^-$, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary heteroaryl, $P(O)R^7R^8$, $P^+R^7R^8A^-$, and $P(O)(OR^7)OR^8$, and

wherein said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can optionally have one or more carbons replaced by O, $NR^7$, $N^+R^7R^8A^-$, S, SO, $SO_2$, $S^+R^7A-$, $PR^7$, $P(O)R^7$,

$P^+R^7R^8A^-$, or phenylene.

4. A compound of claim 3, wherein $R^5$ or $R^6$ has the formula (II)



(II)

5. A compound of claim 4, wherein n is 1 or 2.

6. A compound of claim 5, wherein one of $R^7$ or $R^8$ is H and the other of $R^7$ or $R^8$ is alkyl.

7. A compound of claim 5, wherein both $R^7$ and $R^8$ are H.

8. A compound of claim 7, wherein $R^1$ and $R^2$ are independently selected from the group consisting of H and alkyl.

9. A compound of claim 8, wherein said alkyl is a $C_1$-$C_{10}$ alkyl.

10. A compound of claim 8, wherein $R^1$ and $R^2$ are both alkyl.

11. A compound of claim 10, wherein said alkyl is a $C_1$-$C_{10}$ alkyl.

12. A compound of claim 11, wherein said alkyl is a $C_2$-$C_7$ alkyl.

13. A compound of claim 12, wherein said alkyl is a $C_2$-$C_4$ alkyl.

14. A compound of claim 13, wherein said alkyl is independently selected from the group consisting of ethyl, n-propyl, n-butyl, and isobutyl.

15. A compound of claim 8, wherein $R^1$ and $R^2$ are each n-butyl.

16. A compound of claim 8, wherein one of $R^1$ and $R^2$ is ethyl and the other of $R^1$ and $R^2$ is n-butyl.

17. A compound of claim 15, wherein q is 1, 2, or 3.

18. A compound of claim 16, wherein q is 1, 2, or 3.

19. A compound of claim 17, wherein q is 1 or 2.

20. A compound of claim 19, wherein q is 1.

21. A compound of claim 18, wherein q is 1 or 2.

22. A compound of claim 21, wherein q is 1.

23. A compound of claim 19, wherein $R^3$ and $R^4$ are independently selected from the group consisting of H

and $OR^9$.

24. A compound of claim 21, wherein $R^3$ and $R^4$ are independently selected from the group consisting of H and $OR^9$.

25. A compound of claim 23, wherein $R^9$ is H.

26. A compound of claim 24, wherein $R^9$ is H.

27. A compound of claim 25, wherein one or more $R^x$ are in the 7-, 8-, or 9-position of the benzo ring of formula (I).

28. A compound of claim 26, wherein said $R^x$ is in the 7-, 8-, or 9- position of the benzo ring of formula (I).

29. A compound of claim 27, wherein said $R^x$ are in the 7- and 9- positions of the benzo ring of formula (I).

30. A compound of claim 28, wherein said $R^x$ is in the 7-position of the benzo ring of formula (I).

31. A compound of claim 29, wherein said one or more $R^x$ are independently selected from the group consisting of alkyl, aryl, cycloalkyl, heterocycle, polyalkyl, acyloxy, polyether, halogen, $OR^{13}$, $NR^{13}R^{14}$, $NR^{13}NR^{14}R^{15}$, $N^+R^9R^{11}R^{12}A^-$, $SR^{13}$, $S^+R^{13}R^{14}$, $CO_2R^{13}$, $NR^{14}C(O)R^{13}$, and $NR^{14}C(O)R^{13}$,

wherein alkyl, aryl, cycloalkyl, heterocycle, polyalkyl, acyloxy, and polyether, can be further substituted with $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$ $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{11}R^{12}A^-$, $S^+R^9R^{10}A^-$, or C(O)OM, and

wherein in $R^x$, one or more carbons are optionally replaced by O, $NR^{13}$, $N^+R^{13}R^{14}A^-$, S, SO, $SO_2$, $S^+R^{13}A-$, $PR^{13}$, $P(O)R^{13}$, $P^+R^{13}R^{14}A^-$, phenylene, amino acid, peptide, polypeptide, carbohydrate, polyether, or polyalkyl, and

wherein in said polyalkyl, phenylene, amino acid, peptide, polypeptide, and carbohydrate, one or more carbons are optionally replaced by O, $NR^9$, $N^+R^9R^{10}A-$, S, SO, $SO_2$, $S^+R^9A-$, $PR^9$, $P^+R^9R^{10}A-$, or $P(O)R^9$.

32. A compound of claim 30, wherein said $R^x$ is selected from the group consisting of alkyl, aryl, cycloalkyl, heterocycle, polyalkyl, acyloxy, polyether, halogen, $OR^{13}$, $NR^{13}R^{14}$, $NR^{13}NR^{14}R^{15}$, $N^+R^9R^{11}R^{12}A^-$, $SR^{13}$, $S^+R^{13}R^{14}$, $CO_2R^{13}$, $NR^{14}C(O)R^{13}$, and $NR^{14}C(O)R^{13}$,

wherein alkyl, aryl, cycloalkyl, heterocycle, polyalkyl, acyloxy, and polyether, can be further substituted with $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$ $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{11}R^{12}A^-$, $S^+R^9R^{10}A^-$, or C(O)OM, and

wherein in $R^x$, one or more carbons are optionally replaced by O, $NR^{13}$, $N^+R^{13}R^{14}A-$, S, SO, $SO_2$, $S^+R^{13}A-$,

$PR^{13}$, $P(O)R^{13}$, $P^{+}R^{13}R^{14}A^{-}$, phenylene, amino acid, peptide, polypeptide, carbohydrate, polyether, or polyalkyl, and

wherein in said polyalkyl, phenylene, amino acid, peptide, polypeptide, and carbohydrate, one or more carbons are optionally replaced by O, $NR^{9}$, $N^{+}R^{9}R^{10}A^{-}$, S, SO, $SO_2$, $S^{+}R^{9}A^{-}$, $PR^{9}$, $P^{+}R^{9}R^{10}A^{-}$, or $P(O)R^{9}$.

33. A compound of claim 31, wherein said one or more Rx are independently selected from the group consisting of polyether, $OR^{13}$, $NR^{13}R^{14}$, and $N^{+}R^{9}R^{11}R^{12}A^{-}$.

34. A compound of the claim 32, wherein said $R^{x}$ is selected from the group consisting of polyether, $OR^{13}$, $NR^{13}R^{14}$, and $N^{+}R^{9}R^{11}R^{12}A^{-}$.

35. A compound of claim 33, wherein said one or more Rx are independently selected from the group consisting of $OR^{13}$ and $NR^{13}R^{14}$.

36. A compound of claim 34, wherein said $R^{x}$ is independently selected from the group consisting of $OR^{13}$ and $NR^{13}R^{14}$.

37. A compound of claim 35, wherein $R^{13}$ and $R^{14}$ each methyl.

38. A compound of the claim 36, wherein $R^{13}$ and $R^{14}$ each methyl.

39. A compound of claim 31, wherein one or more $R^y$ are independently in the 3- or the 4-position of the phenyl ring of formula (II).

40. A compound of claim 32, wherein one or more $R^y$ are independently in the 3- or the 4- position of the phenyl ring of formula (II).

41. A compound of claim 39, wherein t is 1 or 2.

42. A compound of claim 40, wherein t is 1 or 2.

43. A compound of claim 41, wherein said one or more $R^y$ are independently selected from the group consisting of alkyl, polyether, fluoride, chloride, bromide, iodide, $NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, and $OR^{13}$,

wherein alkyl and polyether can be further substituted with $SO_3R^9$, $N^+R^9R^{11}R^{12}A^-$, and quaternary heteroaryl.

44. A compound of claim 42, wherein said $R^y$ is independently selected from the group consisting of alkyl, polyether, fluoride, chloride, bromide, iodide, $NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, and $OR^{13}$,

wherein alkyl and polyether can be further substituted with $SO_3R^9$, $N^+R^9R^{11}R^{12}A^-$, and quaternary heteroaryl.

45. A compound of claim 43, wherein said one or

more $R^y$ are independently selected from the group consisting of alkyl, polyether, fluoride, $NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, and $OR^{13}$,

wherein alkyl and polyether can be further substituted with $SO_3R^9$, $N^+R^9R^{11}R^{12}A^-$, and quaternary heteroaryl.

46. A compound of claim 44 wherein said $R^y$ is independently selected from the group consisting of alkyl, polyether, fluoride, $NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, and $OR^{13}$,

wherein alkyl and polyether can be further substituted with $SO_3R^9$, $N^+R^9R^{11}R^{12}A^-$, and quaternary heteroaryl.

47. A compound of claim 45, wherein said $R^{13}$ and $R^{14}$ are alkyl,

wherein alkyl can be further substituted with $SO^3R^9$, $N^+R^9R^{11}R^{12}A^-$, and quaternary heteroaryl.

48. A compound of claim 46, wherein said $R^9$ and $R^{10}$ are alkyl,

wherein alkyl can be further substituted with $SO^3R^9$, $N^+R^9R^{11}R^{12}A^-$, and quaternary heteroaryl.

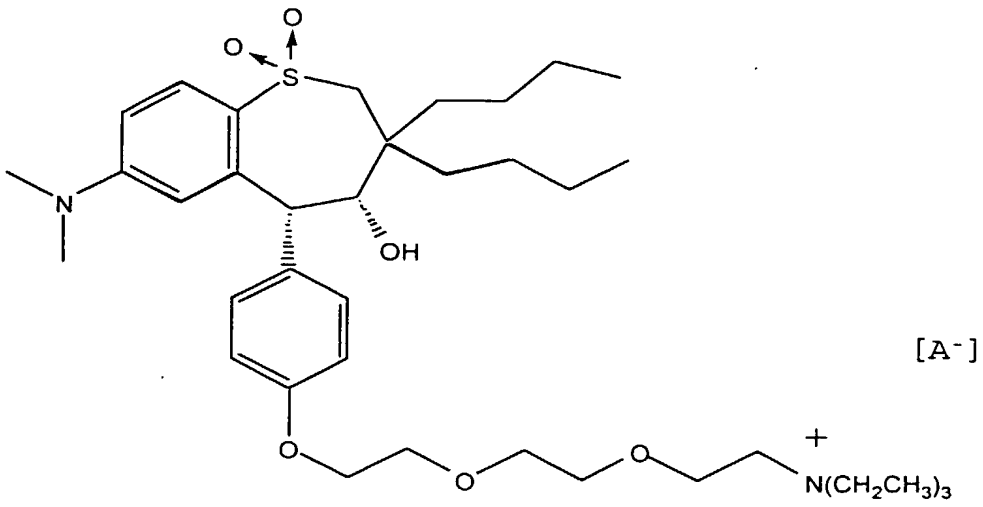
49. A compound of claim 47, wherein n is 2.

50. A compound of claim 48, wherein n is 2.

51. A compound of claim 49, wherein said OH group is in a *syn* relationship to said structure of formula (II).

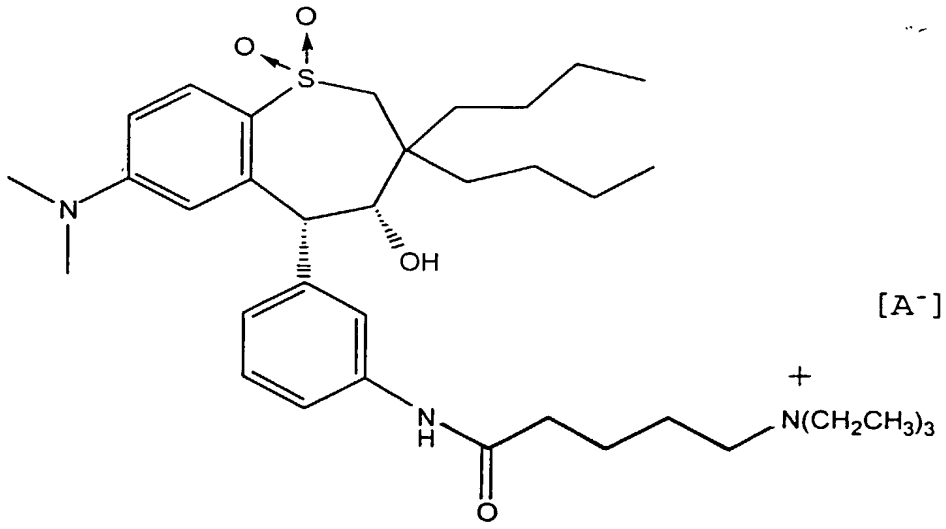
52. A compound of claim 50, wherein said OH group is in a *syn* relationship to said structure of formula (II).

53. A compound of claim 51, having the formula:



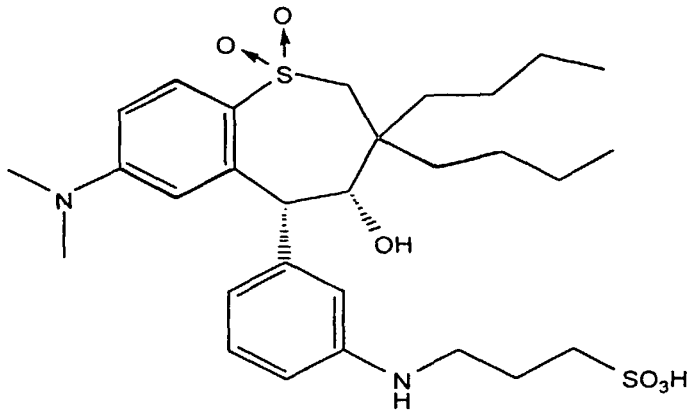

[A⁻]

54. A compound of claim 51, having the formula:

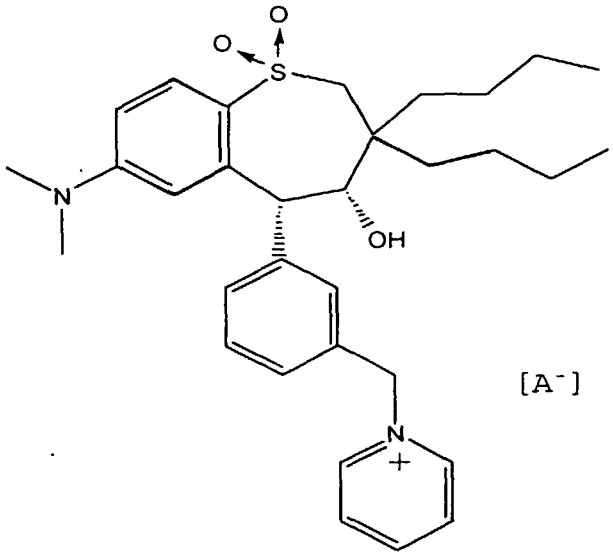



[A⁻]

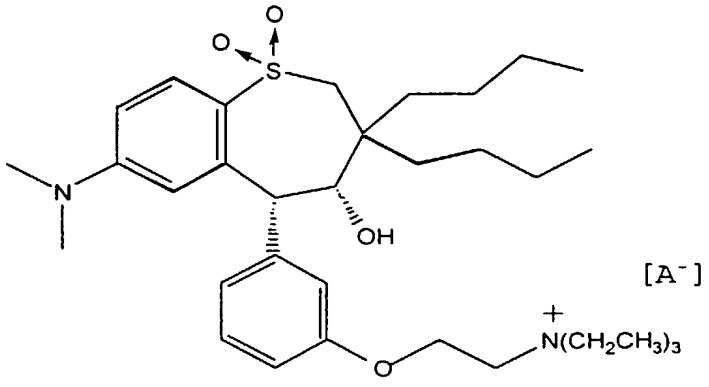
55. A compound of claim 51, having the formula:



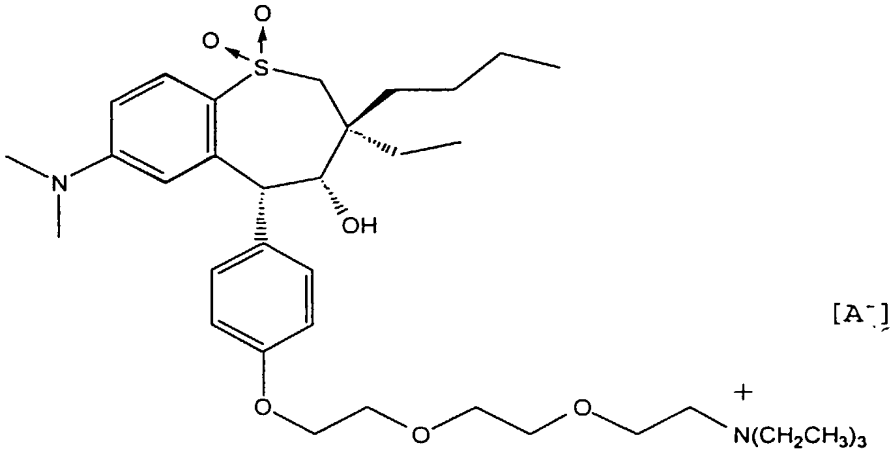

56. A compound of claim 51, having the formula:



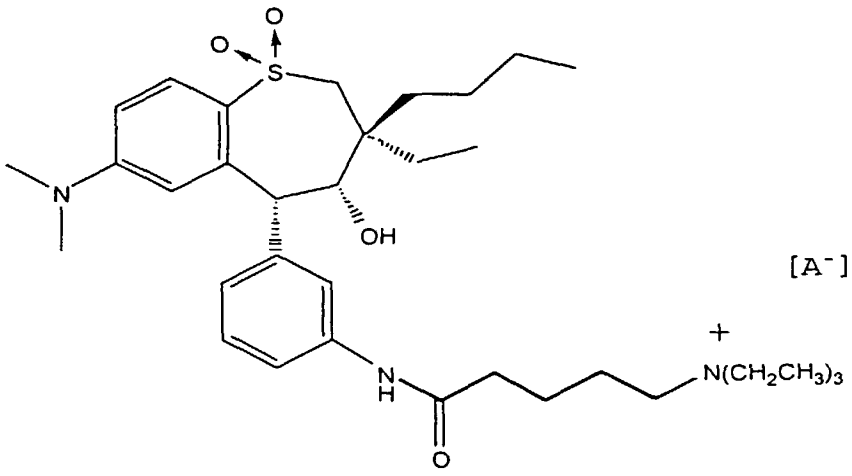
57. A compound of claim 51, having the formula:



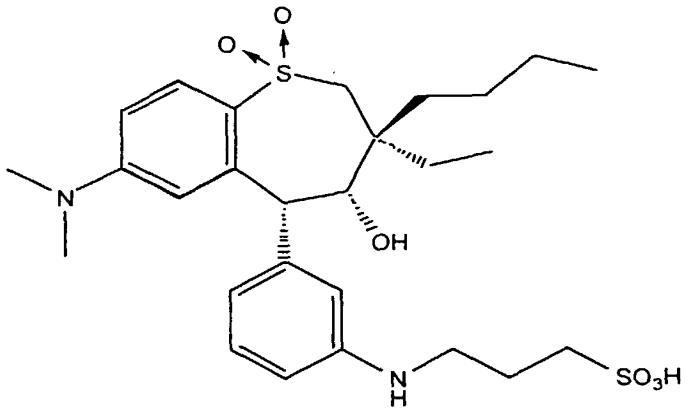

58. A compound of claim 52, having the formula:



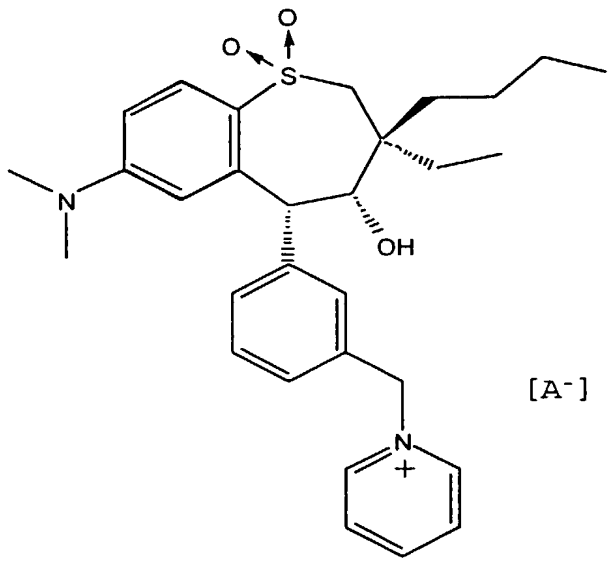
59. A compound of claim 52, having the formula:



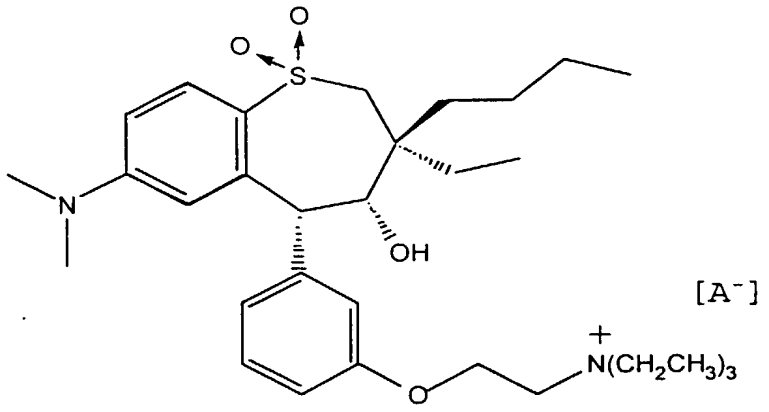

60. A compound of claim 52, having the formula:



61. A compound of claim 52, having the formula:



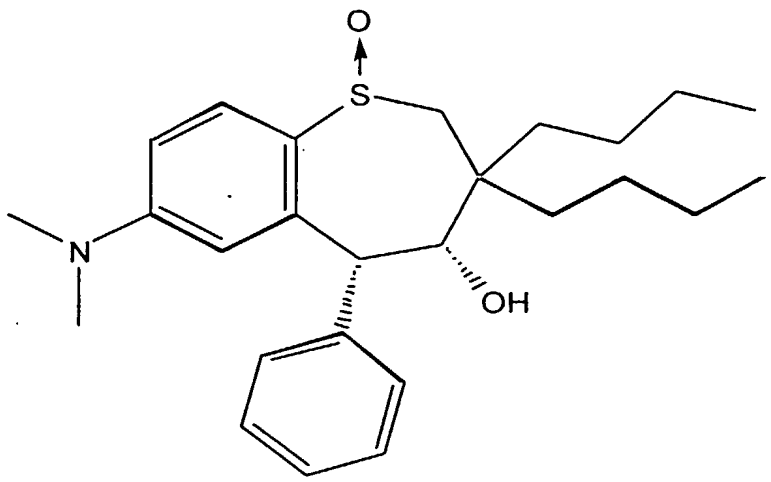

62. A compound of claim 52, having the formula:




63. A compound of claim 31, wherein n is 1.

64. A compound of claim 63, wherein $R^y$ is H.

65. A compound of claim 64, having the formula




66. A compound of claim 4, wherein $R^1$ and $R^2$ are independently selected from the group consisting of H and alkyl.

67. A compound of claim 66, wherein said alkyl is $C_1$-$C_{10}$ alkyl.

68. A compound of claim 67, wherein said alkyl is $C_2$-$C_7$ alkyl.

69. A compound of claim 68, wherein said alkyl is $C_2$-$C_4$ alkyl.

70. A compound of claim 69, wherein $R^1$ and $R^2$ are independently selected from the group consisting of ethyl, n-propyl, n-butyl, and isobutyl.

71. A compound of claim 4, wherein $R^3$ and $R^4$ are independently selected from the group consisting of H and $OR^9$.

72. A compound of claim 71, wherein $R^9$ is H.

73. A compound of claim 4, wherein n is 2.

74. A compound of claim 3, wherein $R^3$ and $R^4$ are independently selected from the group consisting of H and $OR^9$.

75. A compound of claim 74, wherein $R^9$ is H.

76. A compound of claim 3, wherein one of $R^7$ or $R^8$ is H.

77. A compound of claim 76, wherein both $R^7$ and $R^8$ are H.

78. A compound of claim 3, wherein said one or more $R^x$ are independently selected from the group consisting of alkyl, aryl, cycloalkyl, heterocycle, polyalkyl, acyloxy, polyether, halogen, $OR^{13}$, $NR^{13}R^{14}$, $NR^{13}NR^{14}R^{15}$, $N^+R^9R^{11}R^{12}A^-$, $SR^{13}$, $S^+R^{13}R^{14}$, $CO_2R^{13}$, $NR^{14}C(O)R^{13}$, and $NR^{14}C(O)R^{13}$,

wherein alkyl, aryl, cycloalkyl, heterocycle, polyalkyl, acyloxy, and polyether, can be further substituted with $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$ $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{11}R^{12}A^-$, $S^+R^9R^{10}A^-$, or C(O)OM, and

wherein in $R^x$, one or more carbons are optionally replaced by O, $NR^{13}$, $N^+R^{13}R^{14}A-$, S, SO, $SO_2$, $S^+R^{13}A-$, $PR^{13}$, $P(O)R^{13}$, $P^+R^{13}R^{14}A^-$, phenylene, amino acid,

peptide, polypeptide, carbohydrate, polyether, or polyalkyl, and

wherein in said polyalkyl, phenylene, amino acid, peptide, polypeptide, and carbohydrate, one or more carbons are optionally replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $PR^9$, $P^+R^9R^{10}A^-$, or $P(O)R^9$.

79. A compound of claim 78, wherein said one or more $R^x$ are independently selected from the group consisting of polyether, $OR^{13}$, $NR^{13}R^{14}$, and $N^+R^9R^{11}R^{12}A^-$.

80. A compound of claim 79, wherein said one or more $R^x$ are independently selected from the group consisting of $OR^{13}$ and $NR^{13}R^{14}$.

81. A compound of claim 80, wherein $R^{13}$ and $R^{14}$ are each methyl.

82. A compound of claim 3, wherein one or more $R^y$ are independently in the 3- or the 4-position of the phenyl ring of formula (II).

83. A compound of claim 82, wherein one or more $R^y$ is selected from the group consisting of alkyl, polyether, fluoride, chloride, bromide, iodide, $NR^9R^{10}$, and $NC(O)R^9$,

wherein alkyl and polyether can be substituted with $SO_3R^9$, $N^+R^9R^{11}R^{12}A^-$, and quaternary heteroaryl.

84. A compound of claim 83, wherein $R^9$ and $R^{10}$

are alkyl.

85. A compound of claim 84, wherein one or more $R^y$ is selected from the group consisting of alkyl, polyether, fluoride, chloride, bromide, iodide, $NR^9R^{10}$, and $NC(O)R^9$.

86. A compound of claim 1, wherein said one or more $R^x$ are independently selected from the group consisting of alkyl, aryl, cycloalkyl, heterocycle, polyalkyl, acyloxy, polyether, halogen, $OR^{13}$, $NR^{13}R^{14}$, $NR^{13}NR^{14}R^{15}$, $N^+R^9R^{11}R^{12}A^-$, $SR^{13}$, $S^+R^{13}R^{14}$, $CO_2R^{13}$, $NR^{14}C(O)R^{13}$, and $NR^{14}C(O)R^{13}$,

wherein alkyl, aryl, cycloalkyl, heterocycle, polyalkyl, acyloxy, and polyether, can be further substituted with $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$ $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{11}R^{12}A^-$, $S^+R^9R^{10}A^-$, or $C(O)OM$, and

wherein in $R^x$, one or more carbons are optionally replaced by O, $NR^{13}$, $N^+R^{13}R^{14}A-$, S, SO, $SO_2$, $S^+R^{13}A-$, $PR^{13}$, $P(O)R^{13}$; $P^+R^{13}R^{14}A-$, phenylene, amino acid, peptide, polypeptide, carbohydrate, polyether, or polyalkyl, and

wherein in said polyalkyl, phenylene, amino acid, peptide, polypeptide, and carbohydrate, one or more carbons are optionally replaced by O, $NR^9$, $N^+R^9R^{10}A-$, S, SO, $SO_2$, $S^+R^9A-$, $PR^9$, $P^+R^9R^{10}A-$, or $P(O)R^9$.

87. A compound of claim 1, wherein n is 1 or 2.

88. A compound of claim 87, wherein n is 2.

89. A compound of claim 1, wherein $R^1$ and $R^2$ are independently selected from the group consisting of H and alkyl.

90. A compound of claim 89, wherein said alkyl is $C_1$-$C_{10}$ alkyl.

91. A compound of claim 90, wherein said alkyl is $C_2$-$C_7$ alkyl.

92. A compound of claim 91, wherein said alkyl is $C_2$-$C_4$ alkyl.

93. A compound of claim 92, wherein $R^1$ and $R^2$ are independently selected from the group consisting of ethyl, n-propyl, n-butyl, and isobutyl.

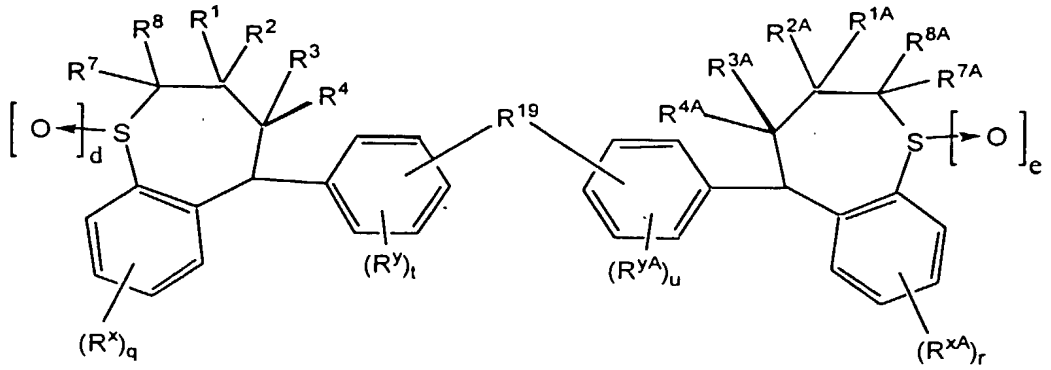
94. A compound of claim 1, wherein $R^3$ and $R^4$ are independently selected from the group consisting of H and $OR^9$.

95. A compound of claim 94, wherein $R^9$ is H.

96. A compound of claim 1, wherein one of $R^7$ or $R^8$ is H.

97. A compound of claim 96, wherein both $R^7$ and $R^8$ are H.

98. A compound of the formula (III)



(III)

wherein :

q and r are independently integers from 0 to 4;

d and e are independently integers from 0 to 2;

t and u are independently integers from 0 to 4;

$R^1$, $R^{1A}$, $R^2$, and $R^{2A}$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkylamino, alkylthio, (polyalkyl)aryl, and cycloalkyl,

wherein alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkylamino, alkylthio, (polyalkyl)aryl, and cycloalkyl optionally are substituted with one or more substituent selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^+R^9R^{10}R^WA^-$, $SR^9$, $S^+R^9A^-$. $P^+R^9R^{10}R^{11}A^-$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, $CO_2R^9$, CN, halogen, oxo, and $CONR^9R^{10}$,

wherein alkyl, alkenyl, alkynyl, alkylaryl, alkoxy, alkoxyalkyl, polyalkyl, aryl, and cycloalkyl optionally have one or more carbons replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $P^+R^9R^{10}A^-$, or phenylene,

wherein $R^9$, $R^{10}$, and $R^W$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, cycloalkyl, aryl, acyl, heterocycle, ammoniumalkyl, alkylammoniumalkyl, and arylalkyl; or

$R^1$ and $R^2$ taken together with the carbon to which they are attached form $C_3$-$C_{10}$ cycloalkylidene, or

$R^{1A}$ and $R^{2A}$ taken together with the carbon to which they are attached form $C_3$-$C_{10}$ cycloalkylidene;

$R^3$, $R^{3A}$, $R^4$, and $R^{4A}$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, acyloxy, aryl, heterocycle, $OR^9$, $NR^9R^{10}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, and $SO_3R^9$, wherein $R^9$ and $R^{10}$ are as defined above; or

$R^3$ and $R^4$ together form =O, $=NOR^{11}$, =S, $=NNR^{11}R^{12}$, $=NR^9$, or $=CR^{11}R^{12}$, or

$R^{3A}$ and $R^{4A}$ together form =O, $=NOR^{11}$, =S, $=NNR^{11}R^{12}$, $=NR^9$, or $=CR^{11}R^{12}$,

wherein $R^{11}$ and $R^{12}$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, aryl, arylalkyl, alkenylalkyl, alkynylalkyl, heterocycle, carboxyalkyl, carboalkoxyalkyl, cycloalkyl, cyanoalkyl, $OR^9$, $NR^9R^{10}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, $CO_2R^9$, CN, halogen, oxo, and $CONR^9R^{10}$, wherein $R^9$ and $R^{10}$ are as defined above, provided that both $R^3$ and $R^4$ cannot be OH, NH2, and SH, or

$R^{11}$ and $R^{12}$ together with the nitrogen or carbon atom to which they are attached form a cyclic ring;

wherein $A^-$ is a pharmaceutically acceptable anion and M is a pharmaceutically acceptable cation;

$R^7$, $R^{7A}$, $R^8$, and $R^{8A}$ are independently selected from the group consisting of hydrogen and alkyl; and

one or more $R^X$ and $R^{xA}$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, polyalkyl, acyloxy, aryl, arylalkyl, halogen,

haloalkyl, cyclcalkyl, heterocycle, heterocycle, polyether, quaternary heterocycle, quaternary heteroaryl, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $S(O)_2R^{13}$, $SO_3R^{13}$, $S^+R^{13}R^{14}A^-$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, $C(O)NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, C(O)OM, $COR^{13}$, $OR^{18}$, $S(O)_nNR^{18}$, $NR^{13}R^{18}$, $NR^{18}OR^{14}$, $N^+R^9R^{11}R^{12}A^-$, $P^+R^9R^{11}R^{12}A^-$, amino acid, peptide, polypeptide, and carbohydrate,

wherein alkyl, alkenyl, alkynyl, cycloalkyl, aryl, polyalkyl, heterocycle, acyloxy, arylalkyl, haloalkyl, polyether, quaternary heterocycle, and quaternary heteroaryl can be further substituted with $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{11}R^{12}A^-$, $S^+R^9R^{10}A^-$, or C(O)OM, and

wherein $R^{18}$ is selected from the group consisting of acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heterocycle, alkyl,

wherein acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heterocycle, alkyl quaternary heterocycle, and quaternary heteroaryl optionally are substituted with one or more substituent selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_3R^9$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, and C(O)OM,

wherein in $R^x$ and $R^{xA}$, one or more carbons are optionally replaced by O, $NR^{13}$, $N^+R^{13}R^{14}A^-$, S, SO, $SO_2$, $S^+R^{13}A^-$, $PR^{13}$, P(O)R13, $P^+R^{13}R^{14}A^-$, phenylene, amino acid, peptide, polypeptide, carbohydrate, polyether, or

polyalkyl,

wherein in said polyalkyl, phenylene, amino acid, peptide, polypeptide, and carbohydrate, one or more carbons are optionally replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $PR^9$, $P^+R^9R^{10}A^-$, or $P(O)R^9$;

wherein quaternary heterocycle and quaternary heteroaryl are optionally substituted with one or more groups selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R15A^-$, $P(OR^{13})OR^{14}$, $S^-R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$,

$R^{19}$ is selected from the group consisting of alkane diyl, alkene diyl, alkyne diyl, polyalkane diyl, alkoxy diyl, polyether diyl, polyalkoxy diyl, carbohydrate, amino acid, and peptide, polypeptide, wherein alkane diyl, alkene diyl, alkyne diyl, polyalkane diyl, alkoxy diyl, polyether diyl, polyalkoxy diyl, carbohydrate, amino acid, and peptide polypeptide, can optionally have one or more carbon replaced by O, $NR^7$, $N^+R^7R^8$, S, SO, $SO^2$, $S^+R^7R^8$, $PR^7$, $P^+R^7R^8$, phenylene, heterocycle, quatarnary heterocycle, quaternary heteroaryl, or aryl,

wherein alkane diyl, alkene diyl, alkyne diyl, polyalkane diyl, alkoxy diyl, polyether diyl, polyalkoxy diyl, carbohydrate, amino acid, peptide, and polypeptide can be substituted with one or more substituent groups independently selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle,

arylalkyl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R15A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$;

wherein one or more $R^y$ and $R^{yA}$ are independently selected from from the group consisting of H, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, quaternary heterocycle, $OR^9$, $SR^9$, $S(O)R^9$, $SO_2R^9$, and $SO_3R^9$,

wherein alkyl, alkenyl, alkynyl, aryl, cycloalkyl, and heterocycle can be substituted with one or more substituent groups independently selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R15A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$,

wherein said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can be further substituted with one or more substituent groups selected from the group consisting of $OR^7$, $NR^7R^8$, $SR^7$, $S(O)R^7$, $SO_2R^7$, $SO_3R^7$, $CO_2R^7$, CN, oxo, $CONR^7R^8$, $N^+R^7R^8R^9A^-$, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary heteroaryl, $P(O)R^7R^8$, $P^+R^7R^8A^-$, and $P(O)(OR^7)OR^8$, and

wherein said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can optionally have one or more carbons replaced by O, $NR^7$, $N^+R^7R^8A^-$, S, SO, $SO_2$, $S^+R^7A^-$, $PR^7$, $P(O)R^7$, $P^+R^7R^8A^-$, or phenylene.

99. A compound of claim 98, wherein $R^1$, $R^{1A}$, $R^2$, and $R^{2A}$ are independently selected from the group consisting of H and alkyl.

100. A compound of claim 99, wherein $R^1$, $R^{1A}$, $R^2$, and $R^{2A}$ are independently selected from the group consisting of H and $C_1$-$C_{10}$ alkyl.

101. A compound of claim 100, wherein said alkyl is a $C_2$-$C_7$ alkyl.

102. A compound of claim 101, wherein $R^1$, $R^{1A}$, $R^2$, and $R^{2A}$ are independently $C_2$-$C_4$ alkyl.

103. A compound of claim 102, wherein $R^1$, $R^{1A}$, $R^2$, and $R^{2A}$ are independently selected from the group consisting of ethyl, n-propyl, n-butyl, and isobutyl.

104. A compound of claim 98, wherein $R^3$, $R^{3A}$, $R^4$, and $R^{4A}$ are independently selected from the group consisting of H and $OR^9$.

105. A compound of claim 104, wherein $R^9$ is H.

106. A compound of claim 98, wherein $R^7$, $R^{7A}$, $R^8$, and $R^{8A}$ are H.

107. A compound of claim 98, wherein d and e are

independently 1 or 2.

108. A compound of claim 107, wherein d and e are both 2.

109. A compound of claim 98, wherein one or more $R^x$ and one or more $R^{xA}$ are independently selected from the group consisting of alkyl, aryl, cycloalkyl, heterocycle, polyalkyl, acyloxy, polyether, halogen, $OR^{13}$, $NR^{13}R^{14}$, $NR^{13}NR^{14}R^{15}$, $N^+R^9R^{11}R^{12}A^-$, $SR^{13}$, $S^+R^{13}R^{14}$, $CO_2R^{13}$, $NR^{14}C(O)R^{13}$, and $NR^{14}C(O)R^{13}$,

wherein alkyl, aryl, cycloalkyl, heterocycle, polyalkyl, acyloxy, and polyether, can be further substituted with $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$ $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{11}R^{12}A^-$, $S^+R^9R^{10}A^-$, or $C(O)OM$, and

wherein in $R^x$, one or more carbons are optionally replaced by O, $NR^{13}$, $N^+R^{13}R^{14}A-$, S, SO, $SO_2$, $S^+R^{13}A-$, $PR^{13}$, $P(O)R^{13}$, $P^+R^{13}R^{14}A-$, phenylene, amino acid, peptide, polypeptide, carbohydrate, polyether, or polyalkyl, and

wherein in said polyalkyl, phenylene, amino acid, peptide, polypeptide, and carbohydrate, one or more carbons are optionally replaced by O, $NR^9$, $N^+R^9R^{10}A-$, S, SO, $SO_2$, $S^+R^9A-$, $PR^9$, $P^+R^9R^{10}A-$, or $P(O)R^9$.

110. A compound of claim 98, wherein one or more $R^y$ and one or more $R^{yA}$ are independently selected from the group consisting of alkyl, polyether, fluoride,

chloride, bromide, iodide, $NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, and $OR^{13}$,

wherein alkyl and polyether can be further substituted with $SO_3R^9$, $N^+R^9R^{11}R^{12}A^-$, and quaternary heteroaryl.

111. A compound of claim 98, wherein $R^{19}$ is selected from the group consisting of alkane diyl, polyalkane diyl, alkoxy diyl, and polyalkoxy diyl, wherein alkane diyl and polyalkane diyl can optionally have one or more carbon replaced by O, NR7, N+R7R8, S, SO, SO2, S+R7R8, PR7, P+R7R8, or phenylene.

112. A compound of claim 111, wherein $R^{19}$ is selected from the group consisting of alkoxy diyl and polyalkoxydiyl wherein one or more carbons are optionally replaced by O, $NR^9$, $N^+R^9R^{10}$, S, SO, $SO_2$, $S^+R^9R^{10}$, $PR^9$, $P^+R^9R^{10}$, phenylene, amino acid, peptide, polypeptide, carbohydrate, or polyalkyl.

113. A compound of claim 112, wherein $R^1$, $R^{1A}$, $R^2$, and $R^{2A}$ are independently selected from the group consisting of H and alkyl.

114. A compound of claim 113, wherein $R^3$, $R^{3A}$, $R^4$, and $R^{4A}$ are independently selected from the group consisting of H and $OR^9$.

115. A compound of claim 114, wherein $R^9$ is H.

116. A compound of claim 115, wherein $R^7$, $R^{7A}$, $R^8$, and $R^{8A}$ are each H.

117. A compound of claim 116, wherein d and e are independently 1 or 2.

118. A compound of claim 117, wherein one or more $R^x$ and one or more $R^{xA}$ are independently selected from the group consisting of alkyl, aryl, cycloalkyl, heterocycle, polyalkyl, acyloxy, polyether, halogen, $OR^{13}$, $NR^{13}R^{14}$, $NR^{13}NR^{14}R^{15}$, $N^+R^9R^{11}R^{12}A^-$, $SR^{13}$, $S^+R^{13}R^{14}$, $CO_2R^{13}$, $NR^{14}C(O)R^{13}$, and $NR^{14}C(O)R^{13}$,

wherein alkyl, aryl, cycloalkyl, heterocycle, polyalkyl, acyloxy, and polyether, can be further substituted with $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$ $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{11}R^{12}A^-$, $S^+R^9R^{10}A^-$, or $C(O)OM$, and

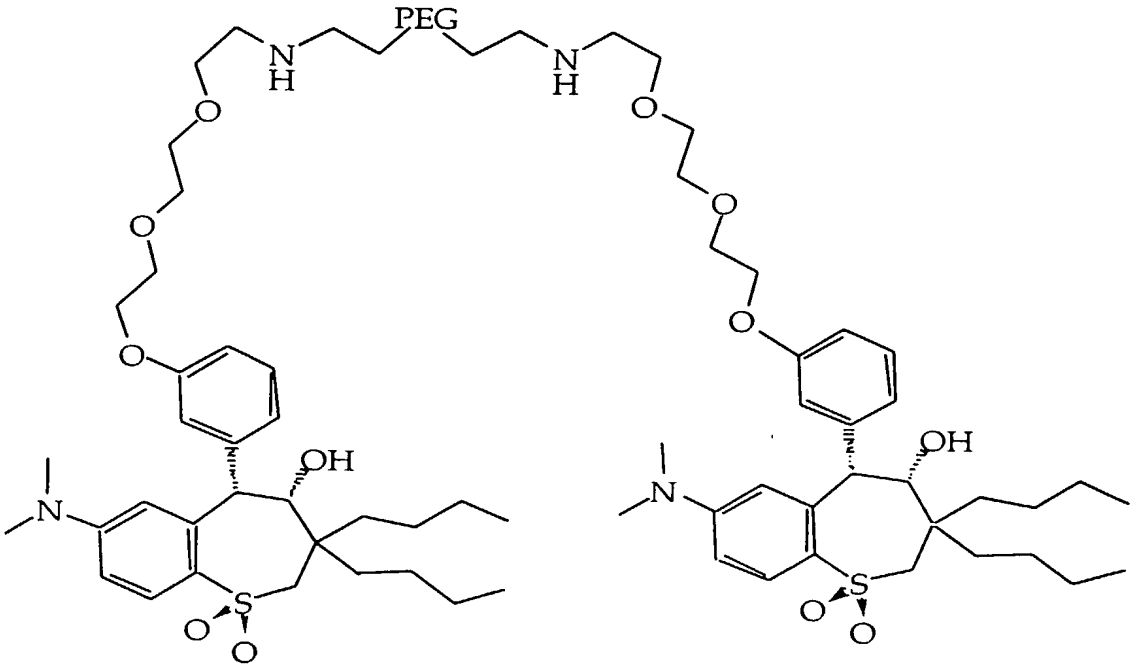
wherein in $R^x$, one or more carbons are optionally replaced by O, $NR^{13}$, $N^+R^{13}R^{14}A-$, S, SO, $SO_2$, $S^+R^{13}A-$, $PR^{13}$, $P(O)R^{13}$, $P^+R^{13}R^{14}A-$, phenylene, amino acid, peptide, polypeptide, carbohydrate, polyether, or polyalkyl, and

wherein in said polyalkyl, phenylene, amino acid, peptide, polypeptide, and carbohydrate, one or more carbons are optionally replaced by O, $NR^9$, $N^+R^9R^{10}A-$, S, SO, $SO_2$, $S^+R^9A-$, $PR^9$, $P^+R^9R^{10}A-$, or $P(O)R^9$.

119. A compound of claim 118, wherein one or more $R^y$ and one or more $R^{yA}$ are independently selected from the group consisting of alkyl, polyether, fluoride, chloride, bromide, iodide, $NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, and $OR^{13}$,

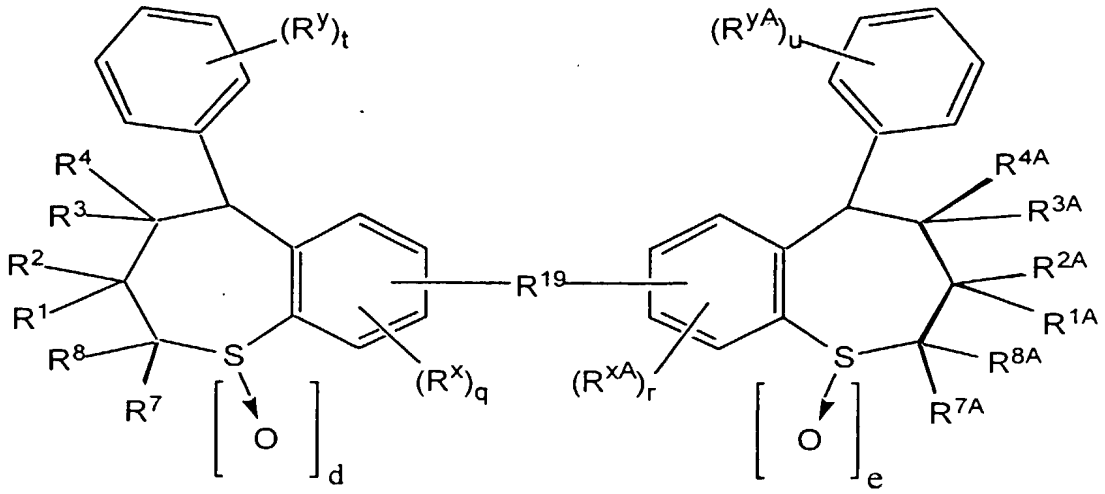
wherein alkyl and polyether can be further substituted with $SO_3R^9$, $N^+R^9R^{11}R^{12}A^-$, and quaternary heteroaryl.

120. A compound of claim 119, having the formula:




PEG = 3400 molecular weight polyethylene glycol polymer chain

121. A compound of the formula (IV)



wherein :

q and r are independently integers from 0 to 3;

d and e are independently integers from 0 to 2;

t and u are independently integers from 0 to 5;

$R^1$, $R^{1A}$, $R^2$, and $R^{2A}$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkylamino, alkylthio, (polyalkyl)aryl, and cycloalkyl,

wherein alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkylamino, alkylthio, (polyalkyl)aryl, and cycloalkyl optionally are substituted with one or more substituent selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^+R^9R^{10}R^WA^-$, $SR^9$, $S^+R^9A-$. $P^+R^9R^{10}R^{11}A^-$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, $CO_2R^9$, CN, halogen, oxo, and $CONR^9R^{10}$,

wherein alkyl, alkenyl, alkynyl, alkylaryl, alkoxy, alkoxyalkyl, polyalkyl, aryl, and cycloalkyl optionally have one or more carbons replaced by O, $NR^9$,

$N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $P^+R^9R^{10}A^-$, or phenylene,

wherein $R^9$, $R^{10}$, and $R^W$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, cycloalkyl, aryl, acyl, heterocycle, ammoniumalkyl, alkylammoniumalkyl, and arylalkyl; or

$R^1$ and $R^2$ taken together with the carbon to which they are attached form $C_3$-$C_{10}$ cycloalkylidene, or

$R^{1A}$ and $R^{2A}$ taken together with the carbon to which they are attached form $C_3$-$C_{10}$ cycloalkylidene;

$R^3$, $R^{3A}$, $R^4$, and $R^{4A}$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, acyloxy, aryl, heterocycle, $OR^9$, $NR^9R^{10}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, and $SO_3R^9$, wherein $R^9$ and $R^{10}$ are as defined above; or

$R^3$ and $R^4$ together form =O, $=NOR^{11}$, =S, $=NNR^{11}R^{12}$, $=NR^9$, or $=CR^{11}R^{12}$, or

$R^{3A}$ and $R^{4A}$ together form =O, $=NOR^{11}$, =S, $=NNR^{11}R^{12}$, $=NR^9$, or $=CR^{11}R^{12}$,

wherein $R^{11}$ and $R^{12}$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, aryl, arylalkyl, alkenylalkyl, alkynylalkyl, heterocycle, carboxyalkyl, carboalkoxyalkyl, cycloalkyl, cyanoalkyl, $OR^9$, $NR^9R^{10}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, $CO_2R^9$, CN, halogen, oxo, and $CONR^9R^{10}$, wherein $R^9$ and $R^{10}$ are as defined above, provided that both $R^3$ and $R^4$ cannot be OH, NH2, and SH, or

$R^{11}$ and $R^{12}$ together with the nitrogen or carbon atom to which they are attached form a cyclic ring;

wherein $A^-$ is a pharmaceutically acceptable anion and M is a pharmaceutically acceptable cation;

$R^7$, $R^{7A}$, $R^8$, and $R^{8A}$ are independently selected from the group consisting of hydrogen and alkyl; and

one or more $R^X$ and $R^{XA}$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, polyalkyl, acyloxy, aryl, arylalkyl, halogen, haloalkyl, cycloalkyl, heterocycle, heterocycle, polyether, quaternary heterocycle, quaternary heteroaryl, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $S(O)_2R^{13}$, $SO_3R^{13}$, $S^+R^{13}R^{14}A^-$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, $C(O)NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, C(O)OM, $COR^{13}$, $OR^{18}$, $S(O)_nNR^{18}$, $NR^{13}R^{18}$, $NR^{18}OR^{14}$, $N^+R^9R^{11}R^{12}A^-$, $P^+R^9R^{11}R^{12}A^-$, amino acid, peptide, polypeptide, and carbohydrate,

wherein alkyl, alkenyl, alkynyl, cycloalkyl, aryl, polyalkyl, heterocycle, acyloxy, arylalkyl, haloalkyl, polyether, quaternary heterocycle, and quaternary heteroaryl can be further substituted with $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{11}R^{12}A^-$, $S^+R^9R^{10}A^-$, or C(O)OM, and

wherein $R^{18}$ is selected from the group consisting of acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heterocycle, alkyl,

wherein acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heterocycle, alkyl quaternary heterocycle, and quaternary heteroaryl optionally are substituted with one or more substituent selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_3R^9$,

$SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, and $C(O)OM$,

wherein in $R^x$ and $R^{xA}$, one or more carbons are optionally replaced by O, $NR^{13}$, $N^+R^{13}R^{14}A^-$, S, SO, $SO_2$, $S^+R^{13}A^-$, $PR^{13}$, P(O)R13, $P^+R^{13}R^{14}A^-$, phenylene, amino acid, peptide, polypeptide, carbohydrate, polyether, or polyalkyl,

wherein in said polyalkyl, phenylene, amino acid, peptide, polypeptide, and carbohydrate, one or more carbons are optionally replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $PR^9$, $P^+R^9R^{10}A^-$, or $P(O)R^9$;

wherein quaternary heterocycle and quaternary heteroaryl are optionally substituted with one or more groups selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R^{15}A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$,

$R^{19}$ is selected from the group consisting of alkane diyl, alkene diyl, alkyne diyl, polyalkane diyl, alkoxy diyl, polyether diyl, polyalkoxy diyl, carbohydrate, amino acid, and peptide, polypeptide, wherein alkane diyl, alkene diyl, alkyne diyl, polyalkane diyl, alkoxy diyl, polyether diyl, polyalkoxy diyl, carbohydrate, amino acid, and peptide polypeptide, can optionally have one or more carbon replaced by O, $NR^7$, $N^+R^7R^8$, S, SO, $SO^2$, $S^+R^7R^8$, $PR^7$, $P^+R^7R^8$, phenylene, heterocycle, quatarnary heterocycle, quaternary heteroaryl, or aryl,

wherein alkane diyl, alkene diyl, alkyne diyl, polyalkane diyl, alkoxy diyl, polyether diyl,

polyalkoxy diyl, carbohydrate, amino acid, peptide, and polypeptide can be substituted with one or more substituent groups independently selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R15A-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$;

wherein said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can be further substituted with one or more substituent groups selected from the group consisting of $OR^7$, $NR^7R^8$, $SR^7$, $S(O)R^7$, $SO_2R^7$, $SO_3R^7$, $CO_2R^7$, CN, oxo, $CONR^7R^8$, $N^+R^7R^8R^9A-$, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary heteroaryl, $P(O)R^7R^8$, $P^+R^7R^8A^-$, and $P(O)(OR^7)OR^8$, and

wherein said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can optionally have one or more carbons replaced by O, $NR^7$, $N^+R^7R^8A-$, S, SO, $SO_2$, $S^+R^7A-$, $PR^7$, $P(O)R^7$, $P^+R^7R^8A-$, or phenylene.

122. A compound of claim 121, wherein $R^1$, $R^{1A}$, $R^2$, and $R^{2A}$ are independently selected from the group consisting of H and alkyl.

123. A compound of claim 122, wherein $R^1$, $R^{1A}$, $R^2$, and $R^{2A}$ are independently selected from the group

consisting of H and $C_1$-$C_{10}$ alkyl.

124. A compound of claim 123, wherein said alkyl is a $C_2$-$C_7$ alkyl.

125. A compound of claim 124, wherein $R^1$, $R^{1A}$, $R^2$, and $R^{2A}$ are independently $C_2$-$C_4$ alkyl.

126. A compound of claim 125, wherein $R^1$, $R^{1A}$, $R^2$, and $R^{2A}$ are independently selected from the group consisting of ethyl, n-propyl, n-butyl, and isobutyl.

127. A compound of claim 125, wherein $R^3$, $R^{3A}$, $R^4$, and $R^{4A}$ are independently selected from the group consisting of H and $OR^9$.

128. A compound of claim 127, wherein $R^9$ is H.

129. A compound of claim 121, wherein $R^7$, $R^{7A}$, $R^8$, and $R^{8A}$ are H.

130. A compound of claim 121, wherein d and e are independently 1 or 2.

131. A compound of claim 130, wherein d and e are both 2.

132. A compound of claim 121, wherein one or more $R^X$ and one or more $R^{XA}$ are independently selected from the group consisting of alkyl, aryl, cycloalkyl, heterocycle, polyalkyl, acyloxy, polyether, halogen, $OR^{13}$, $NR^{13}R^{14}$, $NR^{13}NR^{14}R^{15}$, $N^+R^9R^{11}R^{12}A^-$, $SR^{13}$, $S^+R^{13}R^{14}$, $CO_2R^{13}$, $NR^{14}C(O)R^{13}$, and $NR^{14}C(O)R^{13}$, wherein alkyl, aryl, cycloalkyl, heterocycle,

polyalkyl, acyloxy, and polyether, can be further substituted with $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$ $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{11}R^{12}A^-$, $S^+R^9R^{10}A^-$, or $C(O)OM$, and

wherein in $R^x$, one or more carbons are optionally replaced by O, $NR^{13}$, $N^+R^{13}R^{14}A-$, S, SO, $SO_2$, $S^+R^{13}A-$, $PR^{13}$, $P(O)R^{13}$, $P^+R^{13}R^{14}A-$, phenylene, amino acid, peptide, polypeptide, carbohydrate, polyether, or polyalkyl, and

wherein in said polyalkyl, phenylene, amino acid, peptide, polypeptide, and carbohydrate, one or more carbons are optionally replaced by O, $NR^9$, $N^+R^9R^{10}A-$, S, SO, $SO_2$, $S^+R^9A-$, $PR^9$, $P^+R^9R^{10}A-$, or $P(O)R^9$.

133. A compound of claim 121, wherein one or more $R^y$ and one or more $R^{yA}$ are independently selected from the group consisting of alkyl, polyether, fluoride, chloride, bromide, iodide, $NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, and $OR^{13}$,

wherein alkyl and polyether can be further substituted with $SO_3R^9$, $N^+R^9R^{11}R^{12}A^-$, and quaternary heteroaryl.

134. A compound of claim 121, wherein $R^{19}$ is selected from the group consisting of alkane diyl, polyalkane diyl, alkoxy diyl, and polyalkoxy diyl, wherein alkane diyl and polyalkane diyl can optionally have one or more carbon replaced by O, NR7, N+R7R8, S, SO, SO2, S+R7R8, PR7, P+R7R8, or phenylene.

135. A compound of claim 134, wherein $R^{19}$ is selected from the group consisting of alkoxy diyl and polyalkoxydiyl wherein one or more carbons are optionally replaced by O, $NR^9$, $N^+R^9R^{10}$, S, SO, $SO_2$, $S^+R^9R^{10}$, $PR^9$, $P^+R^9R^{10}$, phenylene, amino acid, peptide, polypeptide, carbohydrate, or polyalkyl.

136. A compound of claim 135, wherein $R^1$, $R^{1A}$, $R^2$, and $R^{2A}$ are independently selected from the group consisting of H and alkyl.

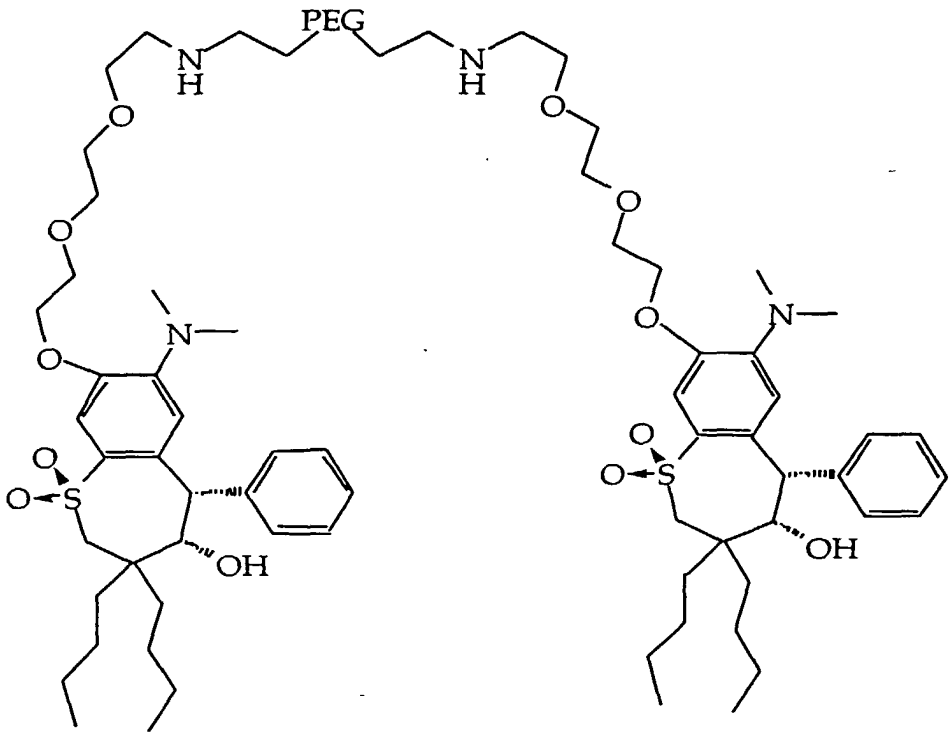
137. A compound of claim 136, wherein $R^3$, $R^{3A}$, $R^4$, and $R^{4A}$ are independently selected from the group consisting of H and $OR^9$.

138. A compound of claim 137, wherein $R^9$ is H.

139. A compound of claim 138, wherein $R^7$, $R^{7A}$, $R^8$, and $R^{8A}$ are each H.

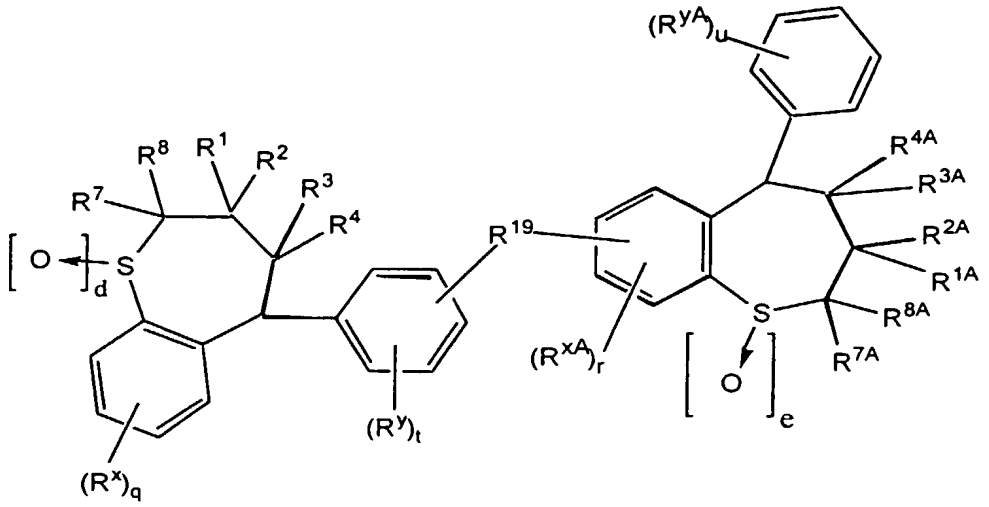
140. A compound of claim 139, wherein d and e are independently 1 or 2.

141. A compound of claim 140, having the formula:




PEG = 3400 molecular weight polyethylene glycol polymer chain

142. A compound of formula (V)



(V)

wherein :

q is an integer from 0 to 4;

r is an integer from 0 to 3;

d and e are independently integers from 0 to 2;

t is an integer from 0 to 4;

u is an integer from 0 to 5;

$R^1$, $R^{1A}$, $R^2$, and $R^{2A}$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkylamino, alkylthio, (polyalkyl)aryl, and cycloalkyl,

wherein alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkylamino, alkylthio, (polyalkyl)aryl, and cycloalkyl optionally are substituted with one or more substituent selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^+R^9R^{10}R^WA^-$, $SR^9$, $S^+R^9A-$. $P^+R^9R^{10}R^{11}A^-$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, $CO_2R^9$, CN, halogen, oxo, and $CONR^9R^{10}$,

wherein alkyl, alkenyl, alkynyl, alkylaryl, alkoxy, alkoxyalkyl, polyalkyl, aryl, and cycloalkyl optionally have one or more carbons replaced by O, $NR^9$,

$N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $P^+R^9R^{10}A^-$, or phenylene,

wherein $R^9$, $R^{10}$, and $R^W$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, cycloalkyl, aryl, acyl, heterocycle, ammoniumalkyl, alkylammoniumalkyl, and arylalkyl; or

$R^1$ and $R^2$ taken together with the carbon to which they are attached form $C_3$-$C_{10}$ cycloalkylidene, or

$R^{1A}$ and $R^{2A}$ taken together with the carbon to which they are attached form $C_3$-$C_{10}$ cycloalkylidene;

$R^3$, $R^{3A}$, $R^4$, and $R^{4A}$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, acyloxy, aryl, heterocycle, $OR^9$, $NR^9R^{10}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, and $SO_3R^9$, wherein $R^9$ and $R^{10}$ are as defined above; or

$R^3$ and $R^4$ together form =O, $=NOR^{11}$, =S, $=NNR^{11}R^{12}$, $=NR^9$, or $=CR^{11}R^{12}$, or

$R^{3A}$ and $R^{4A}$ together form =O, $=NOR^{11}$, =S, $=NNR^{11}R^{12}$, $=NR^9$, or $=CR^{11}R^{12}$,

wherein $R^{11}$ and $R^{12}$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, aryl, arylalkyl, alkenylalkyl, alkynylalkyl, heterocycle, carboxyalkyl, carboalkoxyalkyl, cycloalkyl, cyanoalkyl, $OR^9$, $NR^9R^{10}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, $CO_2R^9$, CN, halogen, oxo, and $CONR^9R^{10}$, wherein $R^9$ and $R^{10}$ are as defined above, provided that both $R^3$ and $R^4$ cannot be OH, NH2, and SH, or

$R^{11}$ and $R^{12}$ together with the nitrogen or carbon atom to which they are attached form a cyclic ring;

wherein $A^-$ is a pharmaceutically acceptable anion and M is a pharmaceutically acceptable cation;

$R^7$, $R^{7A}$, $R^8$, and $R^{8A}$ are independently selected from the group consisting of hydrogen and alkyl; and

one or more $R^X$ and $R^{XA}$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, polyalkyl, acyloxy, aryl, arylalkyl, halogen, haloalkyl, cycloalkyl, heterocycle, heterocycle, polyether, quaternary heterocycle, quaternary heteroaryl, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $S(O)_2R^{13}$, $SO_3R^{13}$, $S^+R^{13}R^{14}A-$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, $C(O)NR^{13}R^{14}$, NR14C(O)R13, C(O)OM, $COR^{13}$, $OR^{18}$, $S(O)_nNR^{18}$, $NR^{13}R^{18}$, $NR^{18}OR^{14}$, $N^+R^9R^{11}R^{12}A^-$, $P^+R^9R^{11}R^{12}A^-$, amino acid, peptide, polypeptide, and carbohydrate,

wherein alkyl, alkenyl, alkynyl, cycloalkyl, aryl, polyalkyl, heterocycle, acyloxy, arylalkyl, haloalkyl, polyether, quaternary heterocycle, and quaternary heteroaryl can be further substituted with $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{11}R^{12}A^-$, $S^+R^9R^{10}A^-$, or C(O)OM, and

wherein $R^{18}$ is selected from the group consisting of acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heterocycle, alkyl,

wherein acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heterocycle, alkyl quaternary heterocycle, and quaternary heteroaryl optionally are substituted with one or more substituent selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_3R^9$,

$SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, and $C(O)OM$,

wherein in $R^x$ and $R^{xA}$, one or more carbons are optionally replaced by O, $NR^{13}$, $N^+R^{13}R^{14}A^-$, S, SO, $SO_2$, $S^+R^{13}A^-$, $PR^{13}$, $P(O)R^{13}$, $P^+R^{13}R^{14}A-$, phenylene, amino acid, peptide, polypeptide, carbohydrate, polyether, or polyalkyl,

wherein in said polyalkyl, phenylene, amino acid, peptide, polypeptide, and carbohydrate, one or more carbons are optionally replaced by O, $NR^9$, $N^+R^9R^{10}A-$, S, SO, $SO_2$, $S^+R^9A-$, $PR^9$, $P^+R^9R^{10}A-$, or $P(O)R^9$;

wherein quaternary heterocycle and quaternary heteroaryl are optionally substituted with one or more groups selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R15A-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$,

$R^{19}$ is selected from the group consisting of alkane diyl, alkene diyl, alkyne diyl, polyalkane diyl, alkoxy diyl, polyether diyl, polyalkoxy diyl, carbohydrate, amino acid, and peptide, polypeptide, wherein alkane diyl, alkene diyl, alkyne diyl, polyalkane diyl, alkoxy diyl, polyether diyl, polyalkoxy diyl, carbohydrate, amino acid, and peptide polypeptide, can optionally have one or more carbon replaced by O, $NR^7$, $N^+R^7R^8$, S, SO, $SO^2$, $S^+R^7R^8$, $PR^7$, $P^+R^7R^8$, phenylene, heterocycle, quatarnary heterocycle, quaternary heteroaryl, or aryl,

wherein alkane diyl, alkene diyl, alkyne diyl, polyalkane diyl, alkoxy diyl, polyether diyl,

polyalkoxy diyl, carbohydrate, amino acid, peptide, and polypeptide can be substituted with one or more substituent groups independently selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R15A-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$;

wherein one or more $R^y$ and $R^{yA}$ are independently selected from from the group consisting of H, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, quaternary heterocycle, $OR^9$, $SR^9$, $S(O)R^9$, $SO_2R^9$, and $SO_3R^9$,

wherein alkyl, alkenyl, alkynyl, aryl, cycloalkyl, and heterocycle can be substituted with one or more substituent groups independently selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R^{15}A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$,

wherein said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can be further substituted with one or more substituent groups selected from the group consisting of $OR^7$, $NR^7R^8$, $SR^7$, $S(O)R^7$, $SO_2R^7$, $SO_3R^7$, $CO_2R^7$, CN, oxo,

$CONR^7R^8$, $N^+R^7R^8R^9A^-$, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary heteroaryl, $P(O)R^7R^8$, $P^+R^7R^8A^-$, and $P(O)(OR^7)OR^8$, and

wherein said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can optionally have one or more carbons replaced by O, $NR^7$, $N^+R^7R^8A^-$, S, SO, $SO_2$, $S^+R^7A^-$, $PR^7$, $P(O)R^7$, $P^+R^7R^8A^-$, or phenylene.

143. A compound of claim 142, wherein $R^1$, $R^{1A}$, $R^2$, and $R^{2A}$ are independently selected from the group consisting of H and alkyl.

144. A compound of claim 143, wherein $R^1$, $R^{1A}$, $R^2$, and $R^{2A}$ are independently selected from the group consisting of H and $C_1$-$C_{10}$ alkyl.

145. A compound of claim 144, wherein said alkyl is a $C_2$-$C_7$ alkyl.

146. A compound of claim 145, wherein $R^1$, $R^{1A}$, $R^2$, and $R^{2A}$ are independently $C_2$-$C_4$ alkyl.

147. A compound of claim 146, wherein $R^1$, $R^{1A}$, $R^2$, and $R^{2A}$ are independently selected from the group consisting of ethyl, n-propyl, n-butyl, and isobutyl.

148. A compound of claim 142, wherein $R^3$, $R^{3A}$, $R^4$, and $R^{4A}$ are independently selected from the group consisting of H and $OR^9$.

149. A compound of claim 148, wherein $R^9$ is H.

150. A compound of claim 142, wherein $R^7$, $R^{7A}$, $R^8$, and $R^{8A}$ are H.

151. A compound of claim 142, wherein d and e are independently 1 or 2.

152. A compound of claim 151, wherein d and e are both 2.

153. A compound of claim 142, wherein one or more $R^X$ and one or more $R^{XA}$ are independently selected from the group consisting of alkyl, aryl, cycloalkyl, heterocycle, polyalkyl, acyloxy, polyether, halogen, $OR^{13}$, $NR^{13}R^{14}$, $NR^{13}NR^{14}R^{15}$, $N^+R^9R^{11}R^{12}A^-$, $SR^{13}$, $S^+R^{13}R^{14}$, $CO_2R^{13}$, $NR^{14}C(O)R^{13}$, and $NR^{14}C(O)R^{13}$,

wherein alkyl, aryl, cycloalkyl, heterocycle, polyalkyl, acyloxy, and polyether, can be further substituted with $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$ $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{11}R^{12}A^-$, $S^+R^9R^{10}A^-$, or $C(O)OM$, and

wherein in $R^X$, one or more carbons are optionally replaced by O, $NR^{13}$, $N^+R^{13}R^{14}A-$, S, SO, $SO_2$, $S^+R^{13}A-$, $PR^{13}$, $P(O)R^{13}$, $P^+R^{13}R^{14}A-$, phenylene, amino acid, peptide, polypeptide, carbohydrate, polyether, or polyalkyl, and

wherein in said polyalkyl, phenylene, amino acid, peptide, polypeptide, and carbohydrate, one or more carbons are optionally replaced by O, $NR^9$, $N^+R^9R^{10}A-$, S, SO, $SO_2$, $S^+R^9A-$, $PR^9$, $P^+R^9R^{10}A-$, or $P(O)R^9$.

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154. A compound of claim 142, wherein one or more $R^y$ and one or more $R^{yA}$ are independently selected from the group consisting of alkyl, polyether, fluoride, chloride, bromide, iodide, $NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, and $OR^{13}$,

wherein alkyl and polyether can be further substituted with $SO_3R^9$, $N^+R^9R^{11}R^{12}A^-$, and quaternary heteroaryl.

155. A compound of claim 142, wherein $R^{19}$ is selected from the group consisting of alkane diyl, polyalkane diyl, alkoxy diyl, and polyalkoxy diyl, wherein alkane diyl and polyalkane diyl can optionally have one or more carbon replaced by O, NR7, N+R7R8, S, SO, SO2, S+R7R8, PR7, P+R7R8, or phenylene.

156. A compound of claim 155, wherein $R^{19}$ is selected from the group consisting of alkoxy diyl and polyalkoxydiyl wherein one or more carbons are optionally replaced by O, $NR^9$, $N^+R^9R^{10}$, S, SO, $SO_2$, $S^+R^9R^{10}$, $PR^9$, $P^+R^9R^{10}$, phenylene, amino acid, peptide, polypeptide, carbohydrate, or polyalkyl.

157. A compound of claim 156, wherein $R^1$, $R^{1A}$, $R^2$, and $R^{2A}$ are independently selected from the group consisting of H and alkyl.

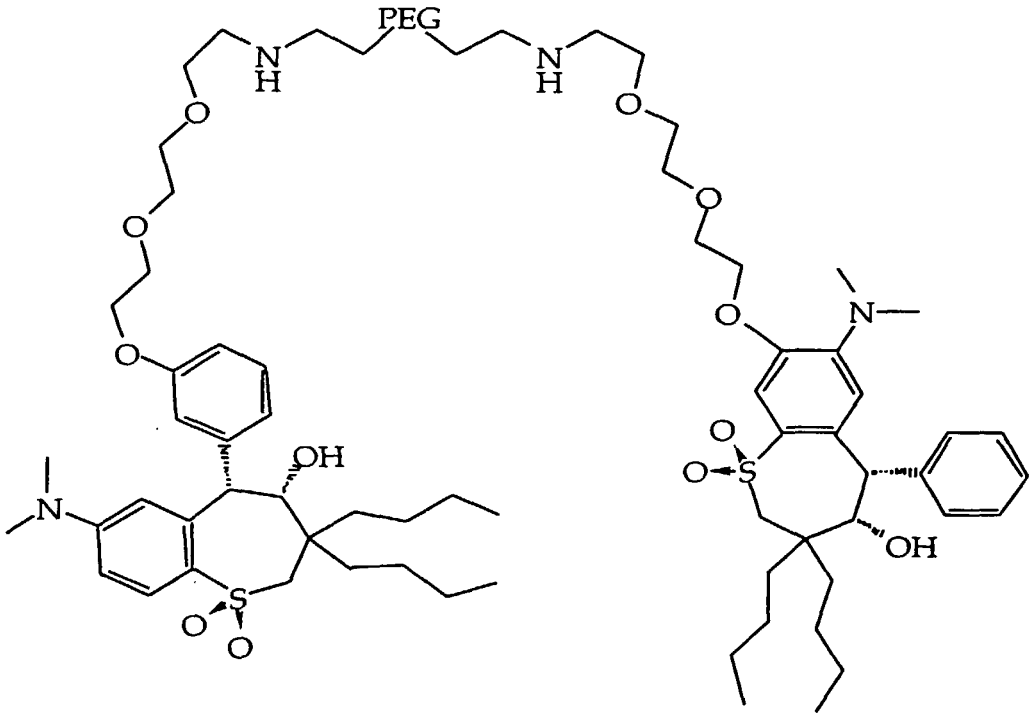
158. A compound of claim 157, wherein $R^3$, $R^{3A}$, $R^4$, and $R^{4A}$ are independently selected from the group consisting of H and $OR^9$.

159. A compound of claim 158, wherein $R^9$ is H.

160. A compound of claim 159, wherein $R^7$, $R^{7A}$, $R^8$, and $R^{8A}$ are each H.

161. A compound of claim 160, wherein d and e are independently 1 or 2.

162. A compound of claim 161, having the formula:




PEG = 3400 molecular weight polyethylene glycol polymer chain

163. A pharmaceutical composition comprising an anti-hyperlipidemic condition effective amount of a compound of formula (I) of claim 1, and
a pharmaceutically acceptable carrier.

164. A pharmaceutical composition comprising an anti-atherosclerotic effective amount of a compound of

a pharmaceutically acceptable cation,

said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can be further substituted with one or more substituent groups selected from the group consisting of $OR^7$, $NR^7R^8$, $SR^7$, $S(O)R^7$, $SO_2R^7$, $SO_3R^7$, $CO_2R^7$, CN, oxo, $CONR^7R^8$, $N^+R^7R^8R^9A^-$, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary heteroaryl, $P(O)R^7R^8$, $P^+R^7R^8R^9A^-$, and $P(O)(OR^7)OR^8$, and

wherein said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can optionally have one or more carbons replaced by O, $NR^7$, $N^+R^7R^8A^-$, S, SO, $SO_2$, $S^+R^7A^-$, $PR^7$, $P(O)R^7$, $P^+R^7R^8A^-$, or phenylene, and $R^{13}$, $R^{14}$, and $R^{15}$ are independently selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, polyalkyl, aryl, arylalkyl, cycloalkyl, heterocycle, heteroaryl, quaternary heterocycle, quaternary heteroaryl, and quaternary heteroarylalkyl,

wherein alkyl, alkenyl, alkynyl, arylalkyl, heterocycle, and polyalkyl optionally have one or more carbons replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $PR^9$, $P^+R^9R^{10}A^-$, $P(O)R^9$, phenylene, carbohydrate, amino acid, peptide, or polypeptide, and

$R^{13}$, $R^{14}$, and $R^{15}$ are optionally substituted with one or more groups selected from the group consisting of sulfoalkyl, quaternary heterocycle, quaternary heteroaryl, $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$,

$SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{10}R^{11}A^-$, $S^+R^9R^{10}A^-$, and C(O)OM,

wherein $R^{16}$ and $R^{17}$ are independently selected from the substituents constituting $R^9$ and M; or

$R^{14}$ and $R^{15}$, together with the nitrogen atom to which they are attached, form a cyclic ring; and

$R^6$ is hydroxy; and

$R^7$ and $R^8$ are independently selected from the group consisting of hydrogen and alkyl; and

one or more $R^x$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, polyalkyl, acyloxy, aryl, arylalkyl, halogen, haloalkyl, cycloalkyl, heterocycle, heteroaryl, polyether, quaternary heterocycle, quaternary heteroaryl, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $S(O)_2R^{13}$, $SO_3R^{13}$, $S^+R^{13}R^{14}A^-$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, $C(O)NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, C(O)OM, $COR^{13}$, $OR^{18}$, $S(O)_nNR^{18}$, $NR^{13}R^{18}$, $NR^{18}OR^{14}$, $N^+R^9R^{11}R^{12}A^-$, $P^+R^9R^{11}R^{12}A^-$, amino acid, peptide, polypeptide, and carbohydrate,

wherein alkyl, alkenyl, alkynyl, cycloalkyl, aryl, polyalkyl, heterocycle, acyloxy, arylalkyl, haloalkyl, polyether, quaternary heterocycle, and quaternary heteroaryl can be further substituted with $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{11}R^{12}A^-$, $S^+R^9R^{10}A^-$, or C(O)OM, and

wherein $R^{18}$ is selected from the group consisting of acyl, arylalkoxycarbonyl, arylalkyl, heterocycle,

heteroaryl, alkyl,

wherein acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heteroaryl, alkyl, quaternary heterocycle, and quaternary heteroaryl optionally are substituted with one or more substituents selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_3R^9$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, and $C(O)OM$,

wherein in $R^x$, one or more carbons are optionally replaced by O, $NR^{13}$, $N^+R^{13}R^{14}A-$, S, SO, $SO_2$, $S^+R^{13}A^-$, $PR^{13}$, $P(O)R^{13}$, $P^+R^{13}R^{14}A-$, phenylene, amino acid, peptide, polypeptide, carbohydrate, polyether, or polyalkyl,

wherein in said polyalkyl, phenylene, amino acid, peptide, polypeptide, and carbohydrate, one or more carbons are optionally replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A-$, $PR^9$, $P^+R^9R^{10}A-$, or $P(O)R^9$;

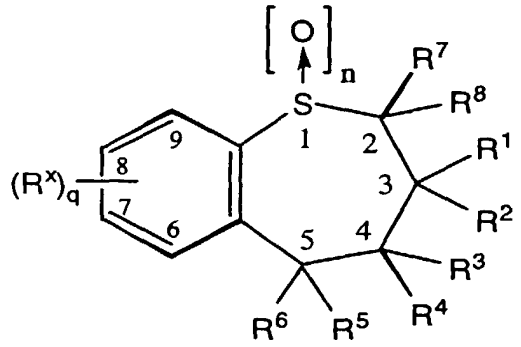
wherein quaternary heterocycle and quaternary heteroaryl are optionally substituted with one or more groups selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R^{15}A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$,

provided that both $R^5$ and $R^6$ cannot be hydrogen, OH, or SH;

provided that when $R^5$ is phenyl, only one of $R^1$ or $R^2$ is H; or

a pharmaceutically acceptable salt, solvate, or prodrug thereof.

170. A compound of formula I:



(I)

wherein:

q is 1 or 2;

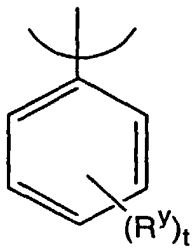
n is 2;

$R^1$ and $R^2$ are each alkyl;

$R^3$ is hydroxy;

$R^4$ and $R^6$ are hydrogen;

$R^5$ has the formula (II)



(II)

wherein t is an integer from 0 to 5;

one or more $R^y$ are $OR^{13}$;

$R^{13}$ is selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, polyalkyl, aryl, arylalkyl, cycloalkyl, heterocycle, heteroaryl,

quaternary heterocycle, quaternary heteroaryl, and quaternary heteroarylalkyl;

said $R^{13}$ alkyl, alkenyl, alkynyl, arylalkyl, heterocycle, and polyalkyl groups optionally have one or more carbons replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $PR^9$, $P^+R^9R^{10}A^-$, $P(O)R^9$, phenylene, carbohydrate, amino acid, peptide, or polypeptide;

$R^{13}$ is optionally substituted with one or more groups selected from the group consisting of sulfoalkyl, quaternary heterocycle, quaternary heteroaryl, $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{10}R^{11}A^-$, $S^+R^9R^{10}A^-$, and $C(O)OM$,

wherein $A^-$ is a pharmaceutically acceptable anion, and M is a pharmaceutically acceptable cation,

$R^9$ and $R^{10}$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, cycloalkyl, aryl, acyl, heterocycle, ammoniumalkyl, arylalkyl, and alkylammoniumalkyl;

$R^{11}$ and $R^{12}$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, aryl, arylalkyl, alkenylalkyl, alkynylalkyl, heterocycle, carboxyalkyl, carboalkoxyalkyl, cycloalkyl, cyanoalkyl, $OR^9$, $NR^9R^{10}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, $CO_2R^9$, CN, halogen, oxo, and $CONR^9R^{10}$, wherein $R^9$ and $R^{10}$ are as defined above, provided that both $R^3$ and $R^4$ cannot be OH, $NH_2$, and SH; or

$R^{11}$ and $R^{12}$ together with the nitrogen or carbon atom to which they are attached form a cyclic ring; and

$R^{16}$ and $R^{17}$ are independently selected from the substituents constituting $R^9$ and M;

$R^7$ and $R^8$ are hydrogen; and

one or more $R^x$ are independently selected from the group consisting of alkoxy, alkylamino and dialkylamino; or

a pharmaceutically acceptable salt, solvate, or prodrug thereof.

171. A compound of claim 170 wherein $R^1$ and $R^2$ are each n-butyl.

172. A compound of claim 171 wherein t is 1, $R^y$ is $OR^{13}$, and $R^{13}$ is as defined in claim 170.

173. A compound of claim 172 wherein one or more $R^x$ are independently selected from methoxy and dimethylamino.

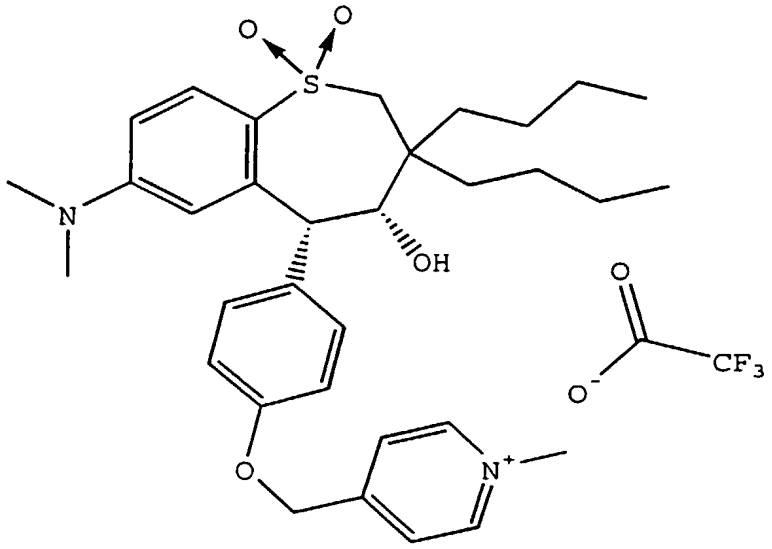
174. A compound of claim 172 wherein $R^x$ is dimethylamino.

175. A compound of claim 172 wherein:
t is 1;
$R^y$ is para-$OR^{13}$; and
$R^{13}$ is as defined in claim 170.

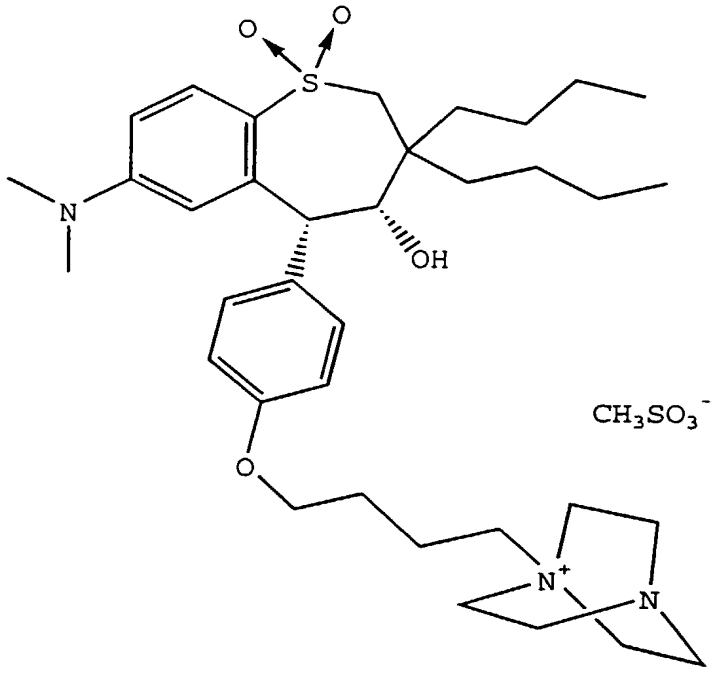
176. A compound of claim 172 wherein:
t is 1;
$R^y$ is meta-$OR^{13}$; and
$R^{13}$ is as defined in claim 170.

177. A compound of claim 172 having the 4R,5R configuration.

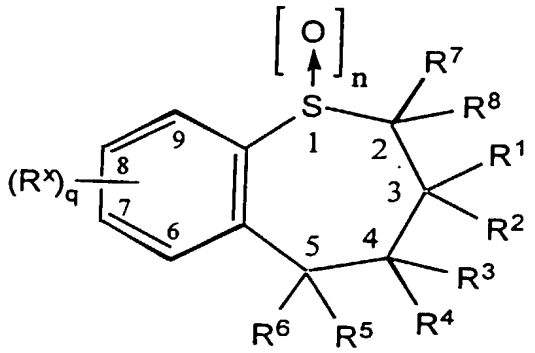
178. A compound of claim 170 having the structural formula:



179. A compound of claim 170 having the structural formula:



180. A compound of formula (I):



(I

wherein:

q is an integer from 1 to 4;

n is an integer from 0 to 2;

$R^1$ and $R^2$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkylamino, alkylthio, (polyalkyl)aryl, and cycloalkyl,

wherein alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkyiamino, alkylthio, (polyalkyl)aryl, and cycloalkyl optionally are substituted with one or more substituents selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^+R^9R^{10}R^wA^-$, $SR^9$, $S^+R^9R^{10}A^-$. $P^+R^9R^{10}R^{11}A^-$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, $CO_2R^9$, CN, halogen, oxo, and $CONR^9R^{10}$,

wherein alkyl, alkenyl, alkynyl, alkylaryl, alkoxy, alkoxyalkyl, (polyalkyl)aryl, and cycloalkyl optionally have one or more carbons replaced by O, $NR^9$, $N^+R^9R^{10}A-$, S, SO, $SO_2$, $S^+R^9A^-$, $P^+R^9R^{10}A^-$, or phenylene,

wherein $R^9$, $R^{10}$, and $R^w$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, cycloalkyl, aryl, acyl, heterocycle,

ammoniumalkyl, arylalkyl, carboxyalkyl, carboxyheteroaryl, carboxyheterocycle, carboalkoxyalkyl, carboxyalkylamino, heteroarylalkyl, heterocyclylalkyl, and alkylammoniumalkyl; or

$R^1$ and $R^2$ taken together with the carbon to which they are attached form $C_3$-$C_{10}$ cycloalkyl;

$R^3$ and $R^4$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, acyloxy, aryl, heterocycle, $OR^9$, $NR^9R^{10}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, and $SO_3R^9$, wherein $R^9$ and $R^{10}$ are as defined above; or

$R^3$ and $R^4$ together form =O, $=NOR^{11}$, =S, $=NNR^{11}R^{12}$, $=NR^9$, or $=CR^{11}R^{12}$,

wherein $R^{11}$ and $R^{12}$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, aryl, arylalkyl, alkenylalkyl, alkynylalkyl, heterocycle, carboxyalkyl, carboalkoxyalkyl, cycloalkyl, cyanoalkyl, $OR^9$, $NR^9R^{10}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, $CO_2R^9$, CN, halogen, oxo, and $CONR^9R^{10}$, wherein $R^9$ and $R^{10}$ are as defined above, provided that both $R^3$ and $R^4$ cannot be OH, $NH_2$, and SH, or

$R^{11}$ and $R^{12}$ together with the nitrogen or carbon atom to which they are attached form a cyclic ring;

$R^5$ is aryl substituted with one or more $OR^{13a}$,

wherein $R^{13a}$ is selected from the group consisting of polyether, aryl, alkylarylalkyl, alkylheteroarylalkyl, alkylheterocyclylalkyl, heterocyclylalkyl, heteroarylalkyl, quaternary heterocyclylalkyl, alkylammoniumalkyl, and carboxyalkylaminocarbonylalkyl,

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$R^{13a}$ is optionally substituted with one or more groups selected from the group consisting of hydroxy, amino, sulfo, carboxy, alkyl, carboxyalkyl, heterocycle, heteroaryl, sulfoalkyl, quaternary heterocycle, quaternary heteroaryl, quaternary heterocyclylalkyl, quaternary heteroarylalkyl, guanidinyl, $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{10}R^{11}A-$, $S^+R^9R^{10}A-$, and $C(O)OM$,

wherein $A^-$ is an pharmaceutically acceptable anion and M is a pharmaceutically acceptable cation,

wherein $R^{16}$ and $R^{17}$ are independently selected from the substituents constituting $R^9$ and M; and

$R^6$ is selected from the group consisting of H, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, quaternary heterocycle, $OR^{30}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, and $SO_3R^9$,

wherein alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, quaternary heterocycle, and quaternary heteroaryl can be substituted with one or more substituent groups independently selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary heteroaryl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $NR^{13}C(O)R^{14}$, $NR^{13}C(O)NR^{14}R^{15}$, $NR^{13}CO_2R^{14}$, $OC(O)R^{13}$, $OC(O)NR^{13}R^{14}$, $NR^{13}SOR^{14}$, $NR^{13}SO_2R^{14}$, $NR^{13}SONR^{14}R^{15}$,

$NR^{13}SO_2NR^{14}R^{15}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R^{15}A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$,

wherein:

$A^-$ is a pharmaceutically acceptable anion and M is a pharmaceutically acceptable cation,

said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can be further substituted with one or more substituent groups selected from the group consisting of $OR^7$, $NR^7R^8$, $SR^7$, $S(O)R^7$, $SO_2R^7$, $SO_3R^7$, $CO_2R^7$, CN, oxo, $CONR^7R^8$, $N^+R^7R^8R^9A-$, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary heteroaryl, $P(O)R^7R^8$, $P^+R^7R^8R^9A^-$, and $P(O)(OR^7)OR^8$, and

wherein said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can optionally have one or more carbons replaced by O, $NR^7$, $N^+R^7R^8A-$, S, SO, $SO_2$, $S^+R^7A-$, $PR^7$, $P(O)R^7$, $P^+R^7R^8A-$, or phenylene, and $R^{13}$, $R^{14}$, and $R^{15}$ are independently selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, arylalkyl, alkylarylalkyl, alkylheteroarylalkyl, alkylheterocyclylalkyl, cycloalkyl, heterocycle, heteroaryl, quaternary heterocycle, quaternary heteroaryl, heterocyclylalkyl, heteroarylalkyl, quaternary heterocyclylalkyl, quaternary heteroarylalkyl, alkylammoniumalkyl, and carboxyalkylaminocarbonylalkyl,

wherein alkyl, alkenyl, alkynyl, arylalkyl, heterocycle, and polyalkyl optionally have one or more carbons replaced by O, $NR^9$, $N^+R^9R^{10}A-$, S, SO, $SO_2$,

$S^+R^9A^-$, $PR^9$, $P^+R^9R^{10}A^-$, $P(O)R^9$, phenylene, carbohydrate, amino acid, peptide, or polypeptide, and

$R^{13}$, $R^{14}$, and $R^{15}$ are optionally substituted with one or more groups selected from the group consisting of hydroxy, amino, sulfo, carboxy, alkyl, carboxyalkyl, heterocycle, heteroaryl, sulfoalkyl, quaternary heterocycle, quaternary heteroaryl, quaternary heterocyclylalkyl, quaternary heteroarylalkyl, guanidinyl, $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{10}R^{11}A^-$, $S^+R^9R^{10}A^-$, and $C(O)OM$,

wherein $R^{16}$ and $R^{17}$ are independently selected from the substituents constituting $R^9$ and M; or

$R^{13}$ and $R^{14}$, together with the nitrogen atom to which they are attached form a mono- or polycyclic heterocycle that is optionally substituted with one or more radicals selected from the group consisting of oxo, carboxy and quaternary salts; or

$R^{14}$ and $R^{15}$, together with the nitrogen atom to which they are attached, form a cyclic ring; and

$R^{30}$ is selected from the group consisting of alkyl, alkenyl, alkynyl, cycloalkyl, aryl, acyl, heterocycle, ammoniumalkyl, alkylammoniumalkyl, arylalkyl, carboxyalkyl, carboxyheteroaryl, carboxyheterocycle, carboalkoxyalkyl, carboxyalkylamino, heteroarylalkyl, heterocyclylalkyl, and alkylammoniumalkyl; and

$R^7$ and $R^8$ are independently selected from the group consisting of hydrogen and alkyl; and

one or more $R^x$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl,

polyalkyl, acyloxy, aryl, arylalkyl, halogen, haloalkyl, cycloalkyl, heterocycle, heteroaryl, polyether, quaternary heterocycle, quaternary heteroaryl, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $S(O)_2R^{13}$, $SO_3R^{13}$, $S^+R^{13}R^{14}A^-$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, $C(O)NR^{13}R^{14}$, NR14C(O)R13, C(O)OM, $COR^{13}$, $OR^{18}$, $S(O)_nNR^{18}$, $NR^{13}R^{18}$, $NR^{18}OR^{14}$, $N^+R^9R^{11}R^{12}A^-$, $P^+R^9R^{11}R^{12}A^-$, amino acid, peptide, polypeptide, and carbohydrate,

wherein alkyl, alkenyl, alkynyl, cycloalkyl, aryl, polyalkyl, heterocycle, acyloxy, arylalkyl, haloalkyl, polyether, quaternary heterocycle, and quaternary heteroaryl can be further substituted with $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{11}R^{12}A^-$, $S^+R^9R^{10}A^-$, or C(O)OM, and

wherein $R^{18}$ is selected from the group consisting of acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heteroaryl, alkyl,

wherein acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heteroaryl, alkyl, quaternary heterocycle, and quaternary heteroaryl optionally are substituted with one or more substituents selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_3R^9$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, and C(O)OM,

wherein in $R^x$, one or more carbons are optionally replaced by O, $NR^{13}$, $N^+R^{13}R^{14}A^-$, S, SO, $SO_2$, $S^+R^{13}A^-$, $PR^{13}$, $P(O)R^{13}$, $P^+R^{13}R^{14}A^-$, phenylene, amino acid,

peptide, polypeptide, carbohydrate, polyether, or polyalkyl,

wherein in said polyalkyl, phenylene, amino acid, peptide, polypeptide, and carbohydrate, one or more carbons are optionally replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $PR^9$, $P^+R^9R^{10}A^-$, or $P(O)R^9$;

wherein quaternary heterocycle and quaternary heteroaryl are optionally substituted with one or more groups selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, C(O)OM, $COR^{13}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R^{15}A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$, or

a pharmaceutically acceptable salt, solvate, or prodrug thereof.

181. A compound of claim 180 wherein:

$R^5$ is phenyl substituted with $OR^{13a}$;

$R^{13a}$ is independently selected from the group consisting of polyether, alkylarylalkyl, alkylheteroarylalkyl, alkylheterocyclylalkyl, and carboxyalkylaminocarbonylalkyl; and

$R^{13a}$ is optionally substituted with one or more groups selected from the group consisting of carboxy, quaternary heterocycle, quaternary heteroaryl, and $NR^9R^{10}$.

182. A compound of claim 180 wherein n is 1 or 2.

183. A compound of claim 180 wherein $R^7$ and $R^8$ are independently selected from the group consisting of hydrogen and alkyl.

184. A compound of claim 180 wherein $R^7$ and $R^8$ are hydrogen.

185. A compound of claim 180 wherein $R^3$ and $R^4$ are independently selected from the group consisting of hydrogen and $OR^9$.

186. A compound of claim 180 wherein $R^3$ is hydrogen and $R^4$ is hydroxy.

187. A compound of claim 180 wherein one or more $R^x$ are independently selected from the group consisting of $OR^{13}$ and $NR^{13}R^{14}$.

188. A compound of claim 180 wherein one or more $R^x$ are independently selected from methoxy and dimethylamino.

189. A compound of claim 180 wherein $R^1$ and $R^2$ are independently selected from the group consisting of hydrogen and alkyl.

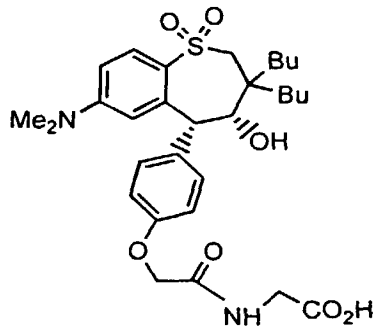
190. A compound of claim 180 wherein $R^1$ and $R^2$ are independently selected from the group consisting alkyl.

191. A compound of claim 180 wherein $R^1$ and $R^2$ are the same alkyl.

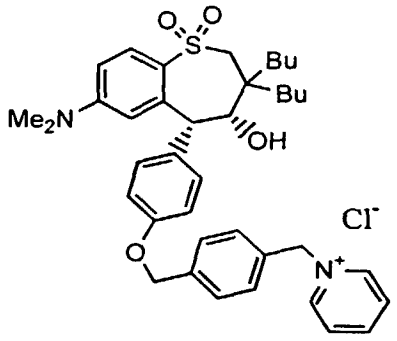
192. A compound of claim 180 wherein $R^1$ and $R^2$ are each n-butyl.

193. A compound of claim 180 wherein
n is 1 or 2;
$R^1$ and $R^2$ are n-butyl;
$R^3$ and $R^6$ are hydrogen;
$R^4$ is hydroxy;
$R^7$ and $R^8$ are hydrogen; and
one or more $R^x$ are independently selected from methoxy and dimethylamino.

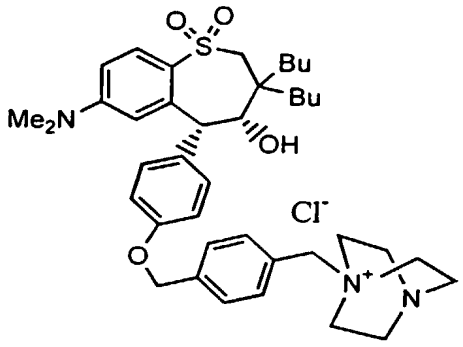
194. A compound of claim 180 having the structural formula:



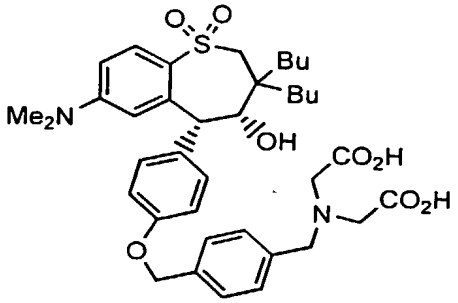

195. A compound of claim 180 having the structural formula:



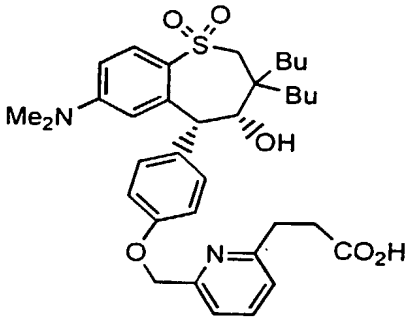

196. A compound of claim 180 having the structural formula:



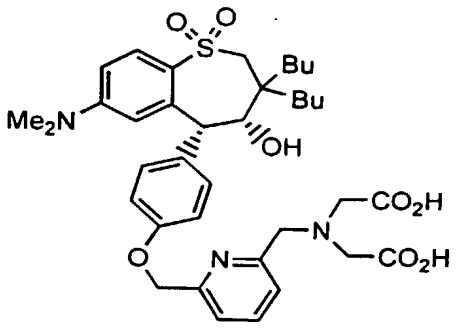
197. A compound of claim 180 having the structural formula:



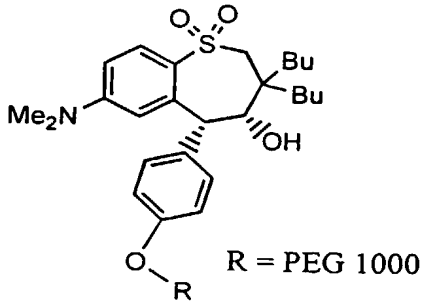
198. A compound of claim 180 having the structural formula:



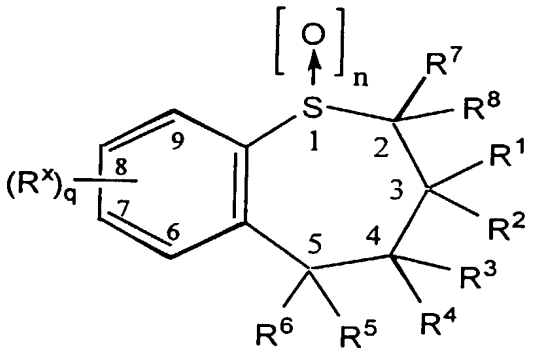
199. A compound of claim 180 having the structural formula:



200. A compound of claim 180 having the structural formula:




201. A compound of formula (I):



(I

wherein:

q is an integer from 1 to 4;

n is an integer from 0 to 2;

$R^1$ and $R^2$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkylamino, alkylthio, (polyalkyl)aryl, and

cycloalkyl,

wherein alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkylamino, alkylthio, (polyalkyl)aryl, and cycloalkyl optionally are substituted with one or more substituents selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^+R^9R^{10}R^wA^-$, $SR^9$, $S^+R^9R^{10}A^-$. $P^+R^9R^{10}R^{11}A^-$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, $CO_2R^9$, CN, halogen, oxo, and $CONR^9R^{10}$,

wherein alkyl, alkenyl, alkynyl, alkylaryl, alkoxy, alkoxyalkyl, (polyalkyl)aryl, and cycloalkyl optionally have one or more carbons replaced by O, $NR^9$, $N^+R^9R^{10}A-$, S, SO, $SO_2$, $S^+R^9A^-$, $P^+R^9R^{10}A^-$, or phenylene,

wherein $R^9$, $R^{10}$, and $R^w$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, cycloalkyl, aryl, acyl, heterocycle, ammoniumalkyl, arylalkyl, carboxyalkyl, carboxyheteroaryl, carboxyheterocycle, carboalkoxyalkyl, carboxyalkylamino, heteroarylalkyl, heterocyclylalkyl, and alkylammoniumalkyl; or

$R^1$ and $R^2$ taken together with the carbon to which they are attached form $C_3$-$C_{10}$ cycloalkyl;

$R^3$ and $R^4$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, acyloxy, aryl, heterocycle, $OR^9$, $NR^9R^{10}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, and $SO_3R^9$, wherein $R^9$ and $R^{10}$ are as defined above; or

$R^3$ and $R^4$ together form =O, $=NOR^{11}$, =S, $=NNR^{11}R^{12}$, $=NR^9$, or $=CR^{11}R^{12}$,

wherein $R^{11}$ and $R^{12}$ are independently selected

from the group consisting of H, alkyl, alkenyl, alkynyl, aryl, arylalkyl, alkenylalkyl, alkynylalkyl, heterocycle, carboxyalkyl, carboalkoxyalkyl, cycloalkyl, cyanoalkyl, $OR^9$, $NR^9R^{10}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, $CO_2R^9$, CN, halogen, oxo, and $CONR^9R^{10}$, wherein $R^9$ and $R^{10}$ are as defined above, provided that both $R^3$ and $R^4$ cannot be OH, $NH_2$, and SH, or

$R^{11}$ and $R^{12}$ together with the nitrogen or carbon atom to which they are attached form a cyclic ring;

$R^5$ is aryl substituted with one or more $OR^{13b}$,

wherein $R^{13b}$ is selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, arylalkyl, alkylarylalkyl, alkylheteroarylalkyl, alkylheterocyclylalkyl, cycloalkyl, heterocycle, heteroaryl, quaternary heterocycle, quaternary heteroaryl, heterocyclylalkyl, heteroarylalkyl, quaternary heterocyclylalkyl, quaternary heteroarylalkyl, alkylammoniumalkyl, and carboxyalkylaminocarbonylalkyl,

$R^{13b}$ is substituted with one or more groups selected from the group consisting of hydroxy, amino, sulfo, carboxy, carboxyalkyl, heterocycle, heteroaryl, sulfoalkyl, quaternary heterocyclylalkyl, quaternary heteroarylalkyl, or guanidinyl, and

$R^6$ is selected from the group consisting of H, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, quaternary heterocycle, $OR^{30}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, and $SO_3R^9$,

wherein alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, quaternary heterocycle, and quaternary heteroaryl can be substituted with one or more

substituent groups independently selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary heteroaryl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $NR^{13}C(O)R^{14}$, $NR^{13}C(O)NR^{14}R^{15}$, $NR^{13}CO_2R^{14}$, $OC(O)R^{13}$, $OC(O)NR^{13}R^{14}$, $NR^{13}SOR^{14}$, $NR^{13}SO_2R^{14}$, $NR^{13}SONR^{14}R^{15}$, $NR^{13}SO_2NR^{14}R^{15}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R^{15}A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$,

wherein:

$A^-$ is a pharmaceutically acceptable anion and M is a pharmaceutically acceptable cation,

said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can be further substituted with one or more substituent groups selected from the group consisting of $OR^7$, $NR^7R^8$, $SR^7$, $S(O)R^7$, $SO_2R^7$, $SO_3R^7$, $CO_2R^7$, CN, oxo, $CONR^7R^8$, $N^+R^7R^8R^9A^-$, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary heteroaryl, $P(O)R^7R^8$, $P^+R^7R^8R^9A^-$, and $P(O)(OR^7)OR^8$, and

wherein said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can optionally have one or more carbons replaced by O, $NR^7$, $N^+R^7R^8A^-$, S, SO, $SO_2$, $S^+R^7A^-$, $PR^7$, $P(O)R^7$, $P^+R^7R^8A^-$, or phenylene, and $R^{13}$, $R^{14}$, and $R^{15}$ are independently selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, polyalkyl,

polyether, aryl, arylalkyl, alkylarylalkyl, alkylheteroarylalkyl, alkylheterocyclylalkyl, cycloalkyl, heterocycle, heteroaryl, quaternary heterocycle, quaternary heteroaryl, heterocyclylalkyl, heteroarylalkyl, quaternary heterocyclylalkyl, quaternary heteroarylalkyl, alkylammoniumalkyl, and carboxyalkylaminocarbonylalkyl,

wherein alkyl, alkenyl, alkynyl, arylalkyl, heterocycle, and polyalkyl optionally have one or more carbons replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $PR^9$, $P^+R^9R^{10}A^-$, $P(O)R^9$, phenylene, carbohydrate, amino acid, peptide, or polypeptide, and

$R^{13}$, $R^{14}$, and $R^{15}$ are optionally substituted with one or more groups selected from the group consisting of hydroxy, amino, sulfo, carboxy, alkyl, carboxyalkyl, heterocycle, heteroaryl, sulfoalkyl, quaternary heterocycle, quaternary heteroaryl, quaternary heterocyclylalkyl, quaternary heteroarylalkyl, guanidinyl, $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{10}R^{11}A^-$, $S^+R^9R^{10}A^-$, and $C(O)OM$,

wherein $R^{16}$ and $R^{17}$ are independently selected from the substituents constituting $R^9$ and M; or

$R^{13}$ and $R^{14}$, together with the nitrogen atom to which they are attached form a mono- or polycyclic heterocycle that is optionally substituted with one or more radicals selected from the group consisting of oxo, carboxy and quaternary salts; or

$R^{14}$ and $R^{15}$, together with the nitrogen atom to which they are attached, form a cyclic ring; and

$R^{30}$ is selected from the group consisting of alkyl, alkenyl, alkynyl, cycloalkyl, aryl, acyl, heterocycle, ammoniumalkyl, alkylammoniumalkyl, arylalkyl, carboxyalkyl, carboxyheteroaryl, carboxyheterocycle, carboalkoxyalkyl, carboxyalkylamino, heteroarylalkyl, heterocyclylalkyl, and alkylammoniumalkyl; and

$R^7$ and $R^8$ are independently selected from the group consisting of hydrogen and alkyl; and

one or more $R^x$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, polyalkyl, acyloxy, aryl, arylalkyl, halogen, haloalkyl, cycloalkyl, heterocycle, heteroaryl, polyether, quaternary heterocycle, quaternary heteroaryl, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $S(O)_2R^{13}$, $SO_3R^{13}$, $S^+R^{13}R^{14}A^-$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, $C(O)NR^{13}R^{14}$, NR14C(O)R13, C(O)OM, $COR^{13}$, $OR^{18}$, $S(O)_nNR^{18}$, $NR^{13}R^{18}$, $NR^{18}OR^{14}$, $N^+R^9R^{11}R^{12}A^-$, $P^+R^9R^{11}R^{12}A^-$, amino acid, peptide, polypeptide, and carbohydrate,

wherein alkyl, alkenyl, alkynyl, cycloalkyl, aryl, polyalkyl, heterocycle, acyloxy, arylalkyl, haloalkyl, polyether, quaternary heterocycle, and quaternary heteroaryl can be further substituted with $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{11}R^{12}A^-$, $S^+R^9R^{10}A^-$, or C(O)OM, and

wherein $R^{18}$ is selected from the group consisting of acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heteroaryl, alkyl,

wherein acyl, arylalkoxycarbonyl, arylalkyl,

heterocycle, heteroaryl, alkyl, quaternary heterocycle, and quaternary heteroaryl optionally are substituted with one or more substituents selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_3R^9$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, and $C(O)OM$,

wherein in $R^x$, one or more carbons are optionally replaced by O, $NR^{13}$, $N^+R^{13}R^{14}A-$, S, SO, $SO_2$, $S^+R^{13}A^-$, $PR^{13}$, $P(O)R^{13}$, $P^+R^{13}R^{14}A-$, phenylene, amino acid, peptide, polypeptide, carbohydrate, polyether, or polyalkyl,

wherein in said polyalkyl, phenylene, amino acid, peptide, polypeptide, and carbohydrate, one or more carbons are optionally replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A-$, $PR^9$, $P^+R^9R^{10}A-$, or $P(O)R^9$;

wherein quaternary heterocycle and quaternary heteroaryl are optionally substituted with one or more groups selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R^{15}A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$, or

a pharmaceutically acceptable salt, solvate, or prodrug thereof.

202. A compound of claim 201 wherein:

$R^5$ is phenyl substituted with $OR^{13b}$;

$R^{13b}$ is independently selected from the group consisting of alkyl, quaternary heteroarylalkyl, and quaternary heterocyclylalkyl; and

$R^{13b}$ is substituted with one or more groups selected from the group consisting of hydroxy, heterocycle, heteroaryl, and guanidinyl.

203. A compound of claim 201 wherein n is 1 or 2.

204. A compound of claim 201 wherein $R^7$ and $R^8$ are independently selected from the group consisting of hydrogen and alkyl.

205. A compound of claim 201 wherein $R^7$ and $R^8$ are hydrogen.

206. A compound of claim 201 wherein $R^3$ and $R^4$ are independently selected from the group consisting of hydrogen and $OR^9$.

207. A compound of claim 201 wherein $R^3$ is hydrogen and $R^4$ is hydroxy.

208. A compound of claim 201 wherein one or more $R^x$ are independently selected from the group consisting of $OR^{13}$ and $NR^{13}R^{14}$.

209. A compound of claim 201 wherein one or more $R^x$ are independently selected from methoxy and dimethylamino.

210. A compound of claim 201 wherein $R^1$ and $R^2$ are independently selected from the group consisting of hydrogen and alkyl.

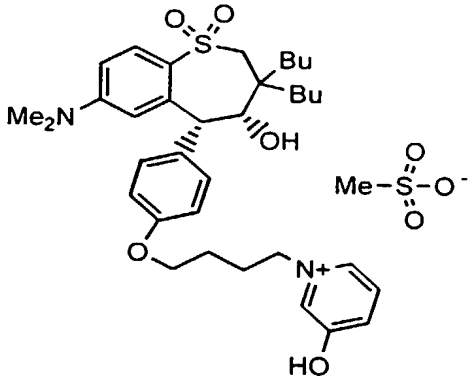
211. A compound of claim 201 wherein $R^1$ and $R^2$ are independently selected from the group consisting alkyl.

212. A compound of claim 201 wherein $R^1$ and $R^2$ are the same alkyl.

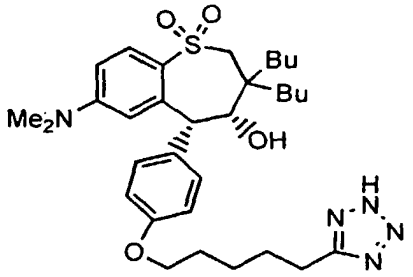
213. A compound of claim 201 wherein $R^1$ and $R^2$ are each n-butyl.

214. A compound of claim 201 wherein
n is 1 or 2;
$R^1$ and $R^2$ are n-butyl;
$R^3$ and $R^6$ are hydrogen;
$R^4$ is hydroxy;
$R^7$ and $R^8$ are hydrogen; and
one or more $R^x$ are independently selected from methoxy and dimethylamino.

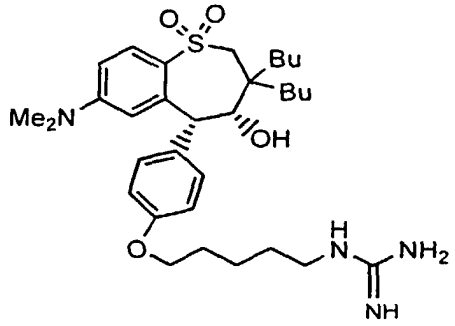
215. A compound of claim 201 having the structural formula:



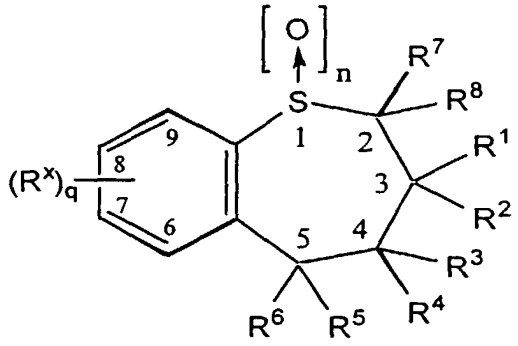

216. A compound of claim 201 having the structural formula:



217. A compound of claim 201 having the structural formula:



218. A compound of formula (I):



(I

wherein:

q is an integer from 1 to 4;

n is an integer from 0 to 2;

$R^1$ and $R^2$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkylamino, alkylthio, (polyalkyl)aryl, and cycloalkyl,

wherein alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkylamino, alkylthio, (polyalkyl)aryl, and cycloalkyl optionally are substituted with one or more substituents selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^+R^9R^{10}R^wA^-$, $SR^9$, $S^+R^9R^{10}A^-$. $P^+R^9R^{10}R^{11}A^-$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, $CO_2R^9$, CN, halogen, oxo, and $CONR^9R^{10}$,

wherein alkyl, alkenyl, alkynyl, alkylaryl, alkoxy, alkoxyalkyl, (polyalkyl)aryl, and cycloalkyl optionally have one or more carbons replaced by O, $NR^9$, $N^+R^9R^{10}A-$, S, SO, $SO_2$, $S^+R^9A^-$, $P^+R^9R^{10}A^-$, or phenylene,

wherein $R^9$, $R^{10}$, and $R^W$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, cycloalkyl, aryl, acyl, heterocycle, ammoniumalkyl, arylalkyl, carboxyalkyl, carboxyheteroaryl, carboxyheterocycle, carboalkoxyalkyl, carboxyalkylamino, heteroarylalkyl, heterocyclylalkyl, and alkylammoniumalkyl; or

$R^1$ and $R^2$ taken together with the carbon to which they are attached form $C_3$-$C_{10}$ cycloalkyl;

$R^3$ and $R^4$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, acyloxy, aryl, heterocycle, $OR^9$, $NR^9R^{10}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, and $SO_3R^9$, wherein $R^9$ and $R^{10}$ are as defined above; or

$R^3$ and $R^4$ together form =O, $=NOR^{11}$, =S, $=NNR^{11}R^{12}$, $=NR^9$, or $=CR^{11}R^{12}$,

wherein $R^{11}$ and $R^{12}$ are independently selected from the group consisting of H, alkyl, alkenyl,

alkynyl, aryl, arylalkyl, alkenylalkyl, alkynylalkyl, heterocycle, carboxyalkyl, carboalkoxyalkyl, cycloalkyl, cyanoalkyl, $OR^9$, $NR^9R^{10}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, $CO_2R^9$, CN, halogen, oxo, and $CONR^9R^{10}$, wherein $R^9$ and $R^{10}$ are as defined above, provided that both $R^3$ and $R^4$ cannot be OH, $NH_2$, and SH, or

$R^{11}$ and $R^{12}$ together with the nitrogen or carbon atom to which they are attached form a cyclic ring;

$R^5$ is aryl substituted with one or more $OR^{13b}$,

wherein $R^{13b}$ is selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, arylalkyl, alkylarylalkyl, alkylheteroarylalkyl, alkylheterocyclylalkyl, cycloalkyl, heterocycle, heteroaryl, quaternary heterocycle, quaternary heteroaryl, heterocyclylalkyl, heteroarylalkyl, quaternary heterocyclylalkyl, quaternary heteroarylalkyl, alkylammoniumalkyl, and carboxyalkylaminocarbonylalkyl,

$R^{13b}$ is substituted with one or more groups selected from the group consisting of $OR^{9a}$, $NR^{9a}R^{10}$, $N^+R^{9a}R^{11}R^{12}A^-$, $SR^{9a}$, $S(O)R^{9a}$, $SO_2R^{9a}$, $SO_3R^{9a}$, $CO_2R^{9a}$, $CONR^{9a}R^{10}$, $SO_2NR^{9a}R^{10}$, $P^+R^{9a}R^{10}R^{11}A-$, and $S^+R^{9a}R^{10}A-$,

wherein $A^-$ is an pharmaceutically acceptable anion and M is a pharmaceutically acceptable cation, and

wherein $R^{9a}$ is selected from the group consisting of carboxyalkyl, carboxyheteroaryl, carboxyheterocycle, carboalkoxyalkyl, and carboxyalkylamino;

$R^6$ is selected from the group consisting of H, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, quaternary heterocycle, $OR^{30}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, and

$SO_3R^9$,

wherein alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, quaternary heterocycle, and quaternary heteroaryl can be substituted with one or more substituent groups independently selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary heteroaryl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $NR^{13}C(O)R^{14}$, $NR^{13}C(O)NR^{14}R^{15}$, $NR^{13}CO_2R^{14}$, $OC(O)R^{13}$, $OC(O)NR^{13}R^{14}$, $NR^{13}SOR^{14}$, $NR^{13}SO_2R^{14}$, $NR^{13}SONR^{14}R^{15}$, $NR^{13}SO_2NR^{14}R^{15}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R^{15}A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$,

wherein:

$A^-$ is a pharmaceutically acceptable anion and M is a pharmaceutically acceptable cation,

said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can be further substituted with one or more substituent groups selected from the group consisting of $OR^7$, $NR^7R^8$, $SR^7$, $S(O)R^7$, $SO_2R^7$, $SO_3R^7$, $CO_2R^7$, CN, oxo, $CONR^7R^8$, $N^+R^7R^8R^9A-$, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary heteroaryl, $P(O)R^7R^8$, $P^+R^7R^8R^9A^-$, and $P(O)(OR^7)OR^8$, and

wherein said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can optionally have one or more carbons replaced by O,

$NR^7$, $N^+R^7R^8A^-$, S, SO, $SO_2$, $S^+R^7A^-$, $PR^7$, $P(O)R^7$, $P^+R^7R^8A^-$, or phenylene, and $R^{13}$, $R^{14}$, and $R^{15}$ are independently selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, arylalkyl, alkylarylalkyl, alkylheteroarylalkyl, alkylheterocyclylalkyl, cycloalkyl, heterocycle, heteroaryl, quaternary heterocycle, quaternary heteroaryl, heterocyclylalkyl, heteroarylalkyl, quaternary heterocyclylalkyl, quaternary heteroarylalkyl, alkylammoniumalkyl, and carboxyalkylaminocarbonylalkyl,

wherein alkyl, alkenyl, alkynyl, arylalkyl, heterocycle, and polyalkyl optionally have one or more carbons replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $PR^9$, $P^+R^9R^{10}A^-$, $P(O)R^9$, phenylene, carbohydrate, amino acid, peptide, or polypeptide, and

$R^{13}$, $R^{14}$, and $R^{15}$ are optionally substituted with one or more groups selected from the group consisting of hydroxy, amino, sulfo, carboxy, alkyl, carboxyalkyl, heterocycle, heteroaryl, sulfoalkyl, quaternary heterocycle, quaternary heteroaryl, quaternary heterocyclylalkyl, quaternary heteroarylalkyl, guanidinyl, $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{10}R^{11}A^-$, $S^+R^9R^{10}A^-$, and $C(O)OM$,

wherein $R^{16}$ and $R^{17}$ are independently selected from the substituents constituting $R^9$ and M; or

$R^{13}$ and $R^{14}$, together with the nitrogen atom to which they are attached form a mono- or polycyclic heterocycle that is optionally substituted with one or

more radicals selected from the group consisting of oxo, carboxy and quaternary salts; or

$R^{14}$ and $R^{15}$, together with the nitrogen atom to which they are attached, form a cyclic ring; and

$R^{30}$ is selected from the group consisting of alkyl, alkenyl, alkynyl, cycloalkyl, aryl, acyl, heterocycle, ammoniumalkyl, alkylammoniumalkyl, arylalkyl, carboxyalkyl, carboxyheteroaryl, carboxyheterocycle, carboalkoxyalkyl, carboxyalkylamino, heteroarylalkyl, heterocyclylalkyl, and alkylammoniumalkyl; and

$R^7$ and $R^8$ are independently selected from the group consisting of hydrogen and alkyl; and

one or more $R^x$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, polyalkyl, acyloxy, aryl, arylalkyl, halogen, haloalkyl, cycloalkyl, heterocycle, heteroaryl, polyether, quaternary heterocycle, quaternary heteroaryl, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $S(O)_2R^{13}$, $SO_3R^{13}$, $S^+R^{13}R^{14}A-$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, $C(O)NR^{13}R^{14}$, NR14C(O)R13, C(O)OM, $COR^{13}$, $OR^{18}$, $S(O)_nNR^{18}$, $NR^{13}R^{18}$, $NR^{18}OR^{14}$, $N^+R^9R^{11}R^{12}A^-$, $P^+R^9R^{11}R^{12}A^-$, amino acid, peptide, polypeptide, and carbohydrate,

wherein alkyl, alkenyl, alkynyl, cycloalkyl, aryl, polyalkyl, heterocycle, acyloxy, arylalkyl, haloalkyl, polyether, quaternary heterocycle, and quaternary heteroaryl can be further substituted with $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{11}R^{12}A^-$, $S^+R^9R^{10}A^-$, or C(O)OM, and

wherein $R^{18}$ is selected from the group consisting of acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heteroaryl, alkyl,

wherein acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heteroaryl, alkyl, quaternary heterocycle, and quaternary heteroaryl optionally are substituted with one or more substituents selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_3R^9$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, and $C(O)OM$,

wherein in $R^x$, one or more carbons are optionally replaced by O, $NR^{13}$, $N^+R^{13}R^{14}A-$, S, SO, $SO_2$, $S^+R^{13}A^-$, $PR^{13}$, $P(O)R^{13}$, $P^+R^{13}R^{14}A-$, phenylene, amino acid, peptide, polypeptide, carbohydrate, polyether, or polyalkyl,

wherein in said polyalkyl, phenylene, amino acid, peptide, polypeptide, and carbohydrate, one or more carbons are optionally replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A-$, $PR^9$, $P^+R^9R^{10}A-$, or $P(O)R^9$;

wherein quaternary heterocycle and quaternary heteroaryl are optionally substituted with one or more groups selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R^{15}A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$, or

a pharmaceutically acceptable salt, solvate, or prodrug thereof.

219. A compound of claim 218 wherein:

$R^5$ is phenyl substituted with $OR^{13b}$;

$R^{13b}$ is alkyl; and

$R^{13b}$ is substituted with one or more groups selected from the group consisting of $OR^{9a}$ and $NR^{9a}R^{10}$; and

$R^{9a}$ is selected from the group consisting of carboxyalkyl, carboxyheteroaryl, and carboxyheterocycle; and

$R^{10}$ is carboxyalkyl.

220. A compound of claim 218 wherein n is 1 or 2.

221. A compound of claim 218 wherein $R^7$ and $R^8$ are independently selected from the group consisting of hydrogen and alkyl.

222. A compound of claim 218 wherein $R^7$ and $R^8$ are hydrogen.

223. A compound of claim 218 wherein $R^3$ and $R^4$ are independently selected from the group consisting of hydrogen and $OR^9$.

224. A compound of claim 218 wherein $R^3$ is hydrogen and $R^4$ is hydroxy.

224. A compound of claim 218 wherein one or more $R^x$ are independently selected from the group consisting of $OR^{13}$ and $NR^{13}R^{14}$.

226. A compound of claim 218 wherein one or more $R^x$ are independently selected from methoxy and

dimethylamino.

227. A compound of claim 218 wherein $R^1$ and $R^2$ are independently selected from the group consisting of hydrogen and alkyl.

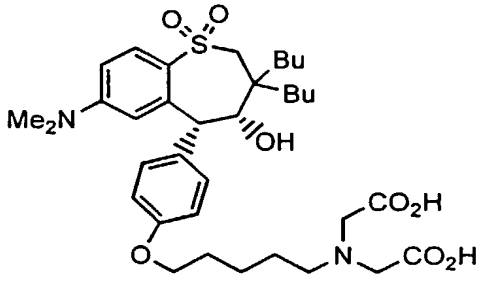
228. A compound of claim 218 wherein $R^1$ and $R^2$ are independently selected from the group consisting alkyl.

229. A compound of claim 218 wherein $R^1$ and $R^2$ are the same alkyl.

230. A compound of claim 218 wherein $R^1$ and $R^2$ are each n-butyl.

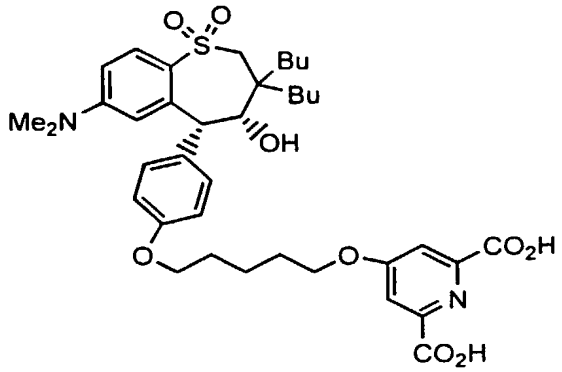
231. A compound of claim 218 wherein
n is 1 or 2;
$R^1$ and $R^2$ are n-butyl;
$R^3$ and $R^6$ are hydrogen;
$R^4$ is hydroxy;
$R^7$ and $R^8$ are hydrogen; and
one or more $R^x$ are independently selected from methoxy and dimethylamino.

232. A compound of claim 218 having the structural formula:

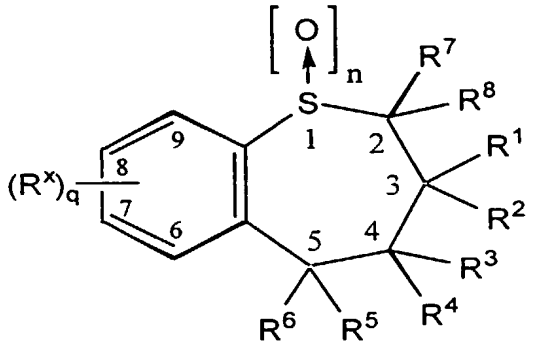



233. A compound of claim 218 having the structural

formula:



234. A compound of formula (I):



(I

wherein:

q is an integer from 1 to 4;

n is an integer from 0 to 2;

$R^1$ and $R^2$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkylamino, alkylthio, (polyalkyl)aryl, and cycloalkyl,

wherein alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkylamino, alkylthio, (polyalkyl)aryl, and cycloalkyl optionally are substituted with one or more substituents selected from the group consisting of $OR^9$,

$NR^9R^{10}$, $N^+R^9R^{10}R^wA^-$, $SR^9$, $S^+R^9R^{10}A^-$. $P^+R^9R^{10}R^{11}A^-$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, $CO_2R^9$, CN, halogen, oxo, and $CONR^9R^{10}$,

wherein alkyl, alkenyl, alkynyl, alkylaryl, alkoxy, alkoxyalkyl, (polyalkyl)aryl, and cycloalkyl optionally have one or more carbons replaced by O, $NR^9$, $N^+R^9R^{10}A-$, S, SO, $SO_2$, $S^+R^9A^-$, $P^+R^9R^{10}A^-$, or phenylene,

wherein $R^9$, $R^{10}$, and $R^w$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, cycloalkyl, aryl, acyl, heterocycle, ammoniumalkyl, arylalkyl, carboxyalkyl, carboxyheteroaryl, carboxyheterocycle, carboalkoxyalkyl, carboxyalkylamino, heteroarylalkyl, heterocyclylalkyl, and alkylammoniumalkyl; or

$R^1$ and $R^2$ taken together with the carbon to which they are attached form $C_3$-$C_{10}$ cycloalkyl;

$R^3$ and $R^4$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, acyloxy, aryl, heterocycle, $OR^9$, $NR^9R^{10}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, and $SO_3R^9$, wherein $R^9$ and $R^{10}$ are as defined above; or

$R^3$ and $R^4$ together form =O, $=NOR^{11}$, =S, $=NNR^{11}R^{12}$, $=NR^9$, or $=CR^{11}R^{12}$,

wherein $R^{11}$ and $R^{12}$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, aryl, arylalkyl, alkenylalkyl, alkynylalkyl, heterocycle, carboxyalkyl, carboalkoxyalkyl, cycloalkyl, cyanoalkyl, $OR^9$, $NR^9R^{10}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, $CO_2R^9$, CN, halogen, oxo, and $CONR^9R^{10}$,

wherein $R^9$ and $R^{10}$ are as defined above, provided that both $R^3$ and $R^4$ cannot be OH, $NH_2$, and SH, or

$R^{11}$ and $R^{12}$ together with the nitrogen or carbon atom to which they are attached form a cyclic ring;

$R^5$ is aryl substituted with one or more $OR^{13b}$,

wherein $R^{13b}$ is selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, arylalkyl, alkylarylalkyl, alkylheteroarylalkyl, alkylheterocyclylalkyl, cycloalkyl, heterocycle, heteroaryl, quaternary heterocycle, quaternary heteroaryl, heterocyclylalkyl, heteroarylalkyl, quaternary heterocyclylalkyl, quaternary heteroarylalkyl, alkylammoniumalkyl, and carboxyalkylaminocarbonylalkyl,

$R^{13b}$ is substituted with one or more groups selected from the group consisting of $NR^9R^{10a}$, $CONR^9R^{10a}$, $SO_2NR^9R^{10a}$, $P^+R^9R^{10a}R^{11}A^-$, and $S^+R^9R^{10a}A^-$,

wherein $A^-$ is an pharmaceutically acceptable anion and M is a pharmaceutically acceptable cation,

wherein $R^{10a}$ is selected from the group consisting of carboxyalkyl, carboalkoxyalkyl, carboxyalkylamino, heteroarylalkyl, and heterocyclylalkyl; or

$R^6$ is selected from the group consisting of H, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, quaternary heterocycle, $OR^{30}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, and $SO_3R^9$,

wherein alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, quaternary heterocycle, and quaternary heteroaryl can be substituted with one or more substituent groups independently selected from the

group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary heteroaryl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $NR^{13}C(O)R^{14}$, $NR^{13}C(O)NR^{14}R^{15}$, $NR^{13}CO_2R^{14}$, $OC(O)R^{13}$, $OC(O)NR^{13}R^{14}$, $NR^{13}SOR^{14}$, $NR^{13}SO_2R^{14}$, $NR^{13}SONR^{14}R^{15}$, $NR^{13}SO_2NR^{14}R^{15}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R^{15}A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$,

wherein:

$A^-$ is a pharmaceutically acceptable anion and M is a pharmaceutically acceptable cation,

said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can be further substituted with one or more substituent groups selected from the group consisting of $OR^7$, $NR^7R^8$, $SR^7$, $S(O)R^7$, $SO_2R^7$, $SO_3R^7$, $CO_2R^7$, CN, oxo, $CONR^7R^8$, $N^+R^7R^8R^9A^-$, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary heteroaryl, $P(O)R^7R^8$, $P^+R^7R^8R^9A^-$, and $P(O)(OR^7)OR^8$, and

wherein said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can optionally have one or more carbons replaced by O, $NR^7$, $N^+R^7R^8A^-$, S, SO, $SO_2$, $S^+R^7A^-$, $PR^7$, $P(O)R^7$, $P^+R^7R^8A^-$, or phenylene, and $R^{13}$, $R^{14}$, and $R^{15}$ are independently selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, arylalkyl, alkylarylalkyl,

alkylheteroarylalkyl, alkylheterocyclylalkyl, cycloalkyl, heterocycle, heteroaryl, quaternary heterocycle, quaternary heteroaryl, heterocyclylalkyl, heteroarylalkyl, quaternary heterocyclylalkyl, quaternary heteroarylalkyl, alkylammoniumalkyl, and carboxyalkylaminocarbonylalkyl,

wherein alkyl, alkenyl, alkynyl, arylalkyl, heterocycle, and polyalkyl optionally have one or more carbons replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $PR^9$, $P^+R^9R^{10}A^-$, $P(O)R^9$, phenylene, carbohydrate, amino acid, peptide, or polypeptide, and

$R^{13}$, $R^{14}$, and $R^{15}$ are optionally substituted with one or more groups selected from the group consisting of hydroxy, amino, sulfo, carboxy, alkyl, carboxyalkyl, heterocycle, heteroaryl, sulfoalkyl, quaternary heterocycle, quaternary heteroaryl, quaternary heterocyclylalkyl, quaternary heteroarylalkyl, guanidinyl, $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{10}R^{11}A^-$, $S^+R^9R^{10}A^-$, and $C(O)OM$,

wherein $R^{16}$ and $R^{17}$ are independently selected from the substituents constituting $R^9$ and M; or

$R^{13}$ and $R^{14}$, together with the nitrogen atom to which they are attached form a mono- or polycyclic heterocycle that is optionally substituted with one or more radicals selected from the group consisting of oxo, carboxy and quaternary salts; or

$R^{14}$ and $R^{15}$, together with the nitrogen atom to which they are attached, form a cyclic ring; and

$R^{30}$ is selected from the group consisting of alkyl, alkenyl, alkynyl, cycloalkyl, aryl, acyl, heterocycle,

ammoniumalkyl, alkylammoniumalkyl, arylalkyl, carboxyalkyl, carboxyheteroaryl, carboxyheterocycle, carboalkoxyalkyl, carboxyalkylamino, heteroarylalkyl, heterocyclylalkyl, and alkylammoniumalkyl; and

$R^7$ and $R^8$ are independently selected from the group consisting of hydrogen and alkyl; and

one or more $R^x$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, polyalkyl, acyloxy, aryl, arylalkyl, halogen, haloalkyl, cycloalkyl, heterocycle, heteroaryl, polyether, quaternary heterocycle, quaternary heteroaryl, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $S(O)_2R^{13}$, $SO_3R^{13}$, $S^+R^{13}R^{14}A^-$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, $C(O)NR^{13}R^{14}$, NR14C(O)R13, C(O)OM, $COR^{13}$, $OR^{18}$, $S(O)_nNR^{18}$, $NR^{13}R^{18}$, $NR^{18}OR^{14}$, $N^+R^9R^{11}R^{12}A^-$, $P^+R^9R^{11}R^{12}A^-$, amino acid, peptide, polypeptide, and carbohydrate,

wherein alkyl, alkenyl, alkynyl, cycloalkyl, aryl, polyalkyl, heterocycle, acyloxy, arylalkyl, haloalkyl, polyether, quaternary heterocycle, and quaternary heteroaryl can be further substituted with $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{11}R^{12}A^-$, $S^+R^9R^{10}A^-$, or C(O)OM, and

wherein $R^{18}$ is selected from the group consisting of acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heteroaryl, alkyl,

wherein acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heteroaryl, alkyl, quaternary heterocycle, and quaternary heteroaryl optionally are substituted

with one or more substituents selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_3R^9$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, and $C(O)OM$,

wherein in $R^x$, one or more carbons are optionally replaced by O, $NR^{13}$, $N^+R^{13}R^{14}A-$, S, SO, $SO_2$, $S^+R^{13}A^-$, $PR^{13}$, $P(O)R^{13}$, $P^+R^{13}R^{14}A-$, phenylene, amino acid, peptide, polypeptide, carbohydrate, polyether, or polyalkyl,

wherein in said polyalkyl, phenylene, amino acid, peptide, polypeptide, and carbohydrate, one or more carbons are optionally replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A-$, $PR^9$, $P^+R^9R^{10}A-$, or $P(O)R^9$;

wherein quaternary heterocycle and quaternary heteroaryl are optionally substituted with one or more groups selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R^{15}A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$, or

a pharmaceutically acceptable salt, solvate, or prodrug thereof.

235. A compound of claim 234 wherein:
$R^5$ is phenyl substituted with $OR^{13b}$;
$R^{13b}$ is alkyl; and
$R^{13b}$ is substituted with $NR^9R^{10a}$; and

$R^9$ is hydrogen; and
$R^{10}$ is heteroarylalkyl.

236. A compound of claim 234 wherein n is 1 or 2.

237. A compound of claim 234 wherein $R^7$ and $R^8$ are independently selected from the group consisting of hydrogen and alkyl.

238. A compound of claim 234 wherein $R^7$ and $R^8$ are hydrogen.

239. A compound of claim 234 wherein $R^3$ and $R^4$ are independently selected from the group consisting of hydrogen and $OR^9$.

240. A compound of claim 234 wherein $R^3$ is hydrogen and $R^4$ is hydroxy.

241. A compound of claim 234 wherein one or more $R^x$ are independently selected from the group consisting of $OR^{13}$ and $NR^{13}R^{14}$.

242. A compound of claim 234 wherein one or more $R^x$ are independently selected from methoxy and dimethylamino.

243. A compound of claim 234 wherein $R^1$ and $R^2$ are independently selected from the group consisting of hydrogen and alkyl.

244. A compound of claim 234 wherein $R^1$ and $R^2$ are independently selected from the group consisting alkyl.

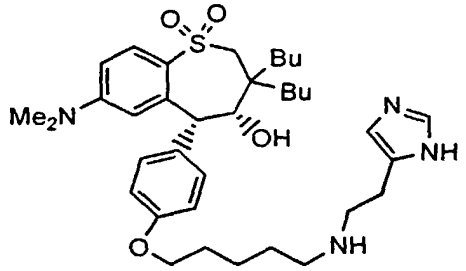
245. A compound of claim 234 wherein $R^1$ and $R^2$ are

the same alkyl.

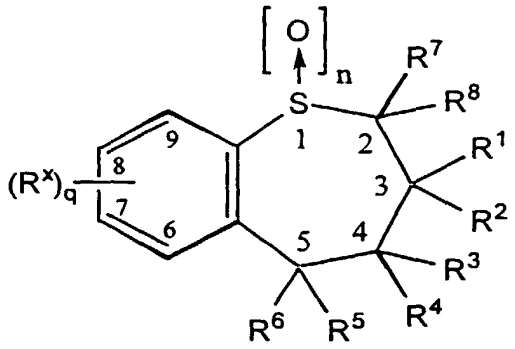
246. A compound of claim 234 wherein $R^1$ and $R^2$ are each n-butyl.

247. A compound of claim 234 wherein
n is 1 or 2;
$R^1$ and $R^2$ are n-butyl;
$R^3$ and $R^6$ are hydrogen;
$R^4$ is hydroxy;
$R^7$ and $R^8$ are hydrogen; and
one or more $R^x$ are independently selected from methoxy and dimethylamino.

248. A compound of claim 234 having the structural formula:




249. A compound of formula (I):




(I

wherein:

q is an integer from 1 to 4;

n is an integer from 0 to 2;

$R^1$ and $R^2$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkylamino, alkylthio, (polyalkyl)aryl, and cycloalkyl,

wherein alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkylamino, alkylthio, (polyalkyl)aryl, and cycloalkyl optionally are substituted with one or more substituents selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^+R^9R^{10}R^wA^-$, $SR^9$, $S^+R^9R^{10}A^-$. $P^+R^9R^{10}R^{11}A^-$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, $CO_2R^9$, CN, halogen, oxo, and $CONR^9R^{10}$,

wherein alkyl, alkenyl, alkynyl, alkylaryl, alkoxy, alkoxyalkyl, (polyalkyl)aryl, and cycloalkyl optionally have one or more carbons replaced by O, $NR^9$, $N^+R^9R^{10}A-$, S, SO, $SO_2$, $S^+R^9A^-$, $P^+R^9R^{10}A^-$, or phenylene,

wherein $R^9$, $R^{10}$, and $R^w$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, cycloalkyl, aryl, acyl, heterocycle, ammoniumalkyl, arylalkyl, carboxyalkyl, carboxyheteroaryl, carboxyheterocycle, carboalkoxyalkyl, carboxyalkylamino, heteroarylalkyl, heterocyclylalkyl, and alkylammoniumalkyl; or

$R^1$ and $R^2$ taken together with the carbon to which they are attached form $C_3$-$C_{10}$ cycloalkyl;

$R^3$ and $R^4$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, acyloxy, aryl, heterocycle, $OR^9$, $NR^9R^{10}$, $SR^9$, $S(O)R^9$,

$SO_2R^9$, and $SO_3R^9$, wherein $R^9$ and $R^{10}$ are as defined above; or

$R^3$ and $R^4$ together form =O, $=NOR^{11}$, =S, $=NNR^{11}R^{12}$, $=NR^9$, or $=CR^{11}R^{12}$,

wherein $R^{11}$ and $R^{12}$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, aryl, arylalkyl, alkenylalkyl, alkynylalkyl, heterocycle, carboxyalkyl, carboalkoxyalkyl, cycloalkyl, cyanoalkyl, $OR^9$, $NR^9R^{10}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, $CO_2R^9$, CN, halogen, oxo, and $CONR^9R^{10}$, wherein $R^9$ and $R^{10}$ are as defined above, provided that both $R^3$ and $R^4$ cannot be OH, $NH_2$, and SH, or

$R^{11}$ and $R^{12}$ together with the nitrogen or carbon atom to which they are attached form a cyclic ring;

$R^5$ is aryl substituted with one or more substituent groups independently selected from the group consisting of $NR^{13}C(O)R^{14}$, $NR^{13}C(O)NR^{14}R^{15}$, $NR^{13}CO_2R^{14}$, $OC(O)R^{13}$, $OC(O)NR^{13}R^{14}$, $NR^{13}SOR^{14}$, $NR^{13}SO_2R^{14}$, $NR^{13}SONR^{14}R^{15}$, and $NR^{13}SO_2NR^{14}R^{15}$,

wherein:

$R^{13}$, $R^{14}$, and $R^{15}$ are independently selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, arylalkyl, alkylarylalkyl, alkylheteroarylalkyl, alkylheterocyclylalkyl, cycloalkyl, heterocycle, heteroaryl, quaternary heterocycle, quaternary heteroaryl, heterocyclylalkyl, heteroarylalkyl, quaternary heterocyclylalkyl, quaternary heteroarylalkyl, alkylammoniumalkyl, and carboxyalkylaminocarbonylalkyl,

$R^{13}$, $R^{14}$, and $R^{15}$ are optionally substituted with

one or more groups selected from the group consisting of hydroxy, amino, sulfo, carboxy, alkyl, carboxyalkyl, heterocycle, heteroaryl, sulfoalkyl, quaternary heterocycle, quaternary heteroaryl, quaternary heterocyclylalkyl, quaternary heteroarylalkyl, guanidinyl, $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{10}R^{11}A-$, $S^+R^9R^{10}A-$, and $C(O)OM$,

wherein $A^-$ is an pharmaceutically acceptable anion and M is a pharmaceutically acceptable cation,

wherein $R^{16}$ and $R^{17}$ are independently selected from the substituents constituting $R^9$ and M; or

$R^{13}$ and $R^{14}$, together with the nitrogen atom to which they are attached form a mono- or polycyclic heterocycle that is optionally substituted with one or more radicals selected from the group consisting of oxo, carboxy and quaternary salts; or

$R^{14}$ and $R^{15}$, together with the nitrogen atom to which they are attached, form a cyclic ring; and

$R^6$ is selected from the group consisting of H, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, quaternary heterocycle, $OR^{30}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, and $SO_3R^9$,

wherein alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, quaternary heterocycle, and quaternary heteroaryl can be substituted with one or more substituent groups independently selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary

heteroaryl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $NR^{13}C(O)R^{14}$, $NR^{13}C(O)NR^{14}R^{15}$, $NR^{13}CO_2R^{14}$, $OC(O)R^{13}$, $OC(O)NR^{13}R^{14}$, $NR^{13}SOR^{14}$, $NR^{13}SO_2R^{14}$, $NR^{13}SONR^{14}R^{15}$, $NR^{13}SO_2NR^{14}R^{15}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R^{15}A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$,

wherein:

$A^-$ is a pharmaceutically acceptable anion and M is a pharmaceutically acceptable cation,

said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can be further substituted with one or more substituent groups selected from the group consisting of $OR^7$, $NR^7R^8$, $SR^7$, $S(O)R^7$, $SO_2R^7$, $SO_3R^7$, $CO_2R^7$, CN, oxo, $CONR^7R^8$, $N^+R^7R^8R^9A-$, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary heteroaryl, $P(O)R^7R^8$, $P^+R^7R^8R^9A^-$, and $P(O)(OR^7)OR^8$, and

wherein said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can optionally have one or more carbons replaced by O, $NR^7$, $N^+R^7R^8A-$, S, SO, $SO_2$, $S^+R^7A-$, $PR^7$, $P(O)R^7$, $P^+R^7R^8A-$, or phenylene, and $R^{13}$, $R^{14}$, and $R^{15}$ are independently selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, arylalkyl, alkylarylalkyl, alkylheteroarylalkyl, alkylheterocyclylalkyl, cycloalkyl, heterocycle, heteroaryl, quaternary heterocycle, quaternary heteroaryl, heterocyclylalkyl,

heteroarylalkyl, quaternary heterocyclylalkyl, quaternary heteroarylalkyl, alkylammoniumalkyl, and carboxyalkylaminocarbonylalkyl,

wherein alkyl, alkenyl, alkynyl, arylalkyl, heterocycle, and polyalkyl optionally have one or more carbons replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $PR^9$, $P^+R^9R^{10}A^-$, $P(O)R^9$, phenylene, carbohydrate, amino acid, peptide, or polypeptide, and

$R^{13}$, $R^{14}$, and $R^{15}$ are optionally substituted with one or more groups selected from the group consisting of hydroxy, amino, sulfo, carboxy, alkyl, carboxyalkyl, heterocycle, heteroaryl, sulfoalkyl, quaternary heterocycle, quaternary heteroaryl, quaternary heterocyclylalkyl, quaternary heteroarylalkyl, guanidinyl, $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{10}R^{11}A^-$, $S^+R^9R^{10}A^-$, and $C(O)OM$,

wherein $R^{16}$ and $R^{17}$ are independently selected from the substituents constituting $R^9$ and M; or

$R^{13}$ and $R^{14}$, together with the nitrogen atom to which they are attached form a mono- or polycyclic heterocycle that is optionally substituted with one or more radicals selected from the group consisting of oxo, carboxy and quaternary salts; or

$R^{14}$ and $R^{15}$, together with the nitrogen atom to which they are attached, form a cyclic ring; and

$R^{30}$ is selected from the group consisting of alkyl, alkenyl, alkynyl, cycloalkyl, aryl, acyl, heterocycle, ammoniumalkyl, alkylammoniumalkyl, arylalkyl, carboxyalkyl, carboxyheteroaryl, carboxyheterocycle, carboalkoxyalkyl, carboxyalkylamino, heteroarylalkyl,

heterocyclylalkyl, and alkylammoniumalkyl; and

$R^7$ and $R^8$ are independently selected from the group consisting of hydrogen and alkyl; and

one or more $R^x$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, polyalkyl, acyloxy, aryl, arylalkyl, halogen, haloalkyl, cycloalkyl, heterocycle, heteroaryl, polyether, quaternary heterocycle, quaternary heteroaryl, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $S(O)_2R^{13}$, $SO_3R^{13}$, $S^+R^{13}R^{14}A^-$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, $C(O)NR^{13}R^{14}$, NR14C(O)R13, C(O)OM, $COR^{13}$, $OR^{18}$, $S(O)_nNR^{18}$, $NR^{13}R^{18}$, $NR^{18}OR^{14}$, $N^+R^9R^{11}R^{12}A^-$, $P^+R^9R^{11}R^{12}A^-$, amino acid, peptide, polypeptide, and carbohydrate,

wherein alkyl, alkenyl, alkynyl, cycloalkyl, aryl, polyalkyl, heterocycle, acyloxy, arylalkyl, haloalkyl, polyether, quaternary heterocycle, and quaternary heteroaryl can be further substituted with $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{11}R^{12}A^-$, $S^+R^9R^{10}A^-$, or C(O)OM, and

wherein $R^{18}$ is selected from the group consisting of acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heteroaryl, alkyl,

wherein acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heteroaryl, alkyl, quaternary heterocycle, and quaternary heteroaryl optionally are substituted with one or more substituents selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_3R^9$,

$SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, and $C(O)OM$,

wherein in $R^x$, one or more carbons are optionally replaced by O, $NR^{13}$, $N^+R^{13}R^{14}A^-$, S, SO, $SO_2$, $S^+R^{13}A^-$, $PR^{13}$, $P(O)R^{13}$, $P^+R^{13}R^{14}A^-$, phenylene, amino acid, peptide, polypeptide, carbohydrate, polyether, or polyalkyl,

wherein in said polyalkyl, phenylene, amino acid, peptide, polypeptide, and carbohydrate, one or more carbons are optionally replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $PR^9$, $P^+R^9R^{10}A^-$, or $P(O)R^9$;

wherein quaternary heterocycle and quaternary heteroaryl are optionally substituted with one or more groups selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R^{15}A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$, or

a pharmaceutically acceptable salt, solvate, or prodrug thereof.

250. A compound of claim 249 wherein $R^5$ is aryl substituted with a radical selected from the group consisting of $NR^{13}C(O)NR^{14}R^{15}$ and $NR^{13}CO_2R^{14}$.

251. A compound of claim 249 wherein $R^5$ is phenyl substituted with a radical selected from the group consisting of $NR^{13}C(O)NR^{14}R^{15}$ and $NR^{13}CO_2R^{14}$.

252. A compound of claim 249 wherein n is 1 or 2.

253. A compound of claim 249 wherein $R^7$ and $R^8$ are independently selected from the group consisting of hydrogen and alkyl.

254. A compound of claim 249 wherein $R^7$ and $R^8$ are hydrogen.

255. A compound of claim 249 wherein $R^3$ and $R^4$ are independently selected from the group consisting of hydrogen and $OR^9$.

256. A compound of claim 249 wherein $R^3$ is hydrogen and $R^4$ is hydroxy.

257. A compound of claim 249 wherein one or more $R^x$ are independently selected from the group consisting of $OR^{13}$ and $NR^{13}R^{14}$.

258. A compound of claim 249 wherein one or more $R^x$ are independently selected from methoxy and dimethylamino.

259. A compound of claim 249 wherein $R^1$ and $R^2$ are independently selected from the group consisting of hydrogen and alkyl.

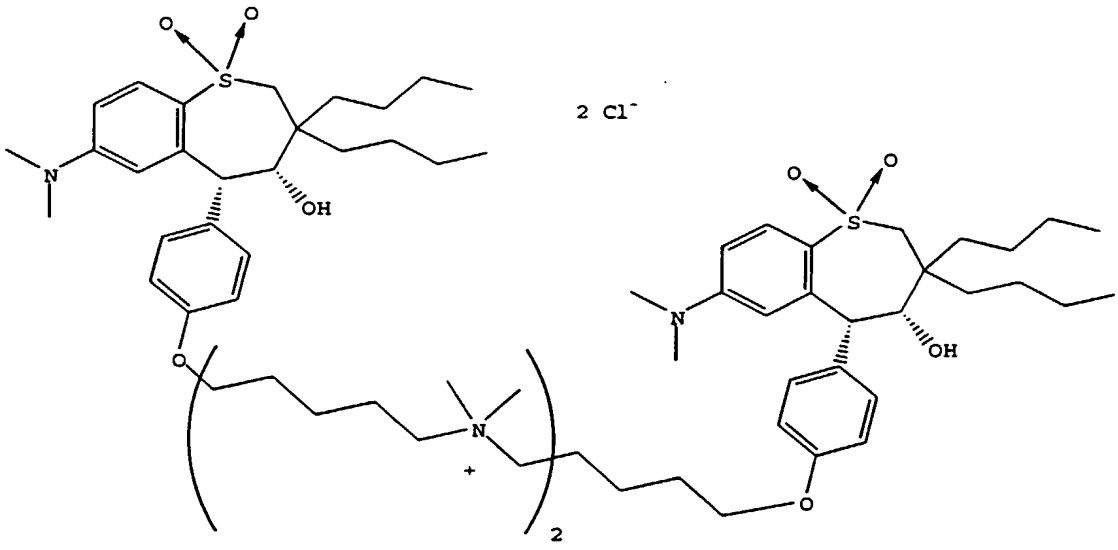
260. A compound of claim 249 wherein $R^1$ and $R^2$ are independently selected from the group consisting alkyl.

261. A compound of claim 249 wherein $R^1$ and $R^2$ are the same alkyl.

262. A compound of claim 249 wherein $R^1$ and $R^2$ are each n-butyl.

263. A compound of claim 249 wherein
n is 1 or 2;
$R^1$ and $R^2$ are n-butyl;
$R^3$ and $R^6$ are hydrogen;
$R^4$ is hydroxy;
$R^7$ and $R^8$ are hydrogen; and
one or more $R^x$ are independently selected from methoxy and dimethylamino.

264. A compound of claim 98 having the structural formula:




265. A pharmaceutical composition comprising an anti-hyperlipidemic condition effective amount of a compound of formula (I) of claim 170, and

a pharmaceutically acceptable carrier.

266. A pharmaceutical composition comprising an anti-atherosclerotic effective amount of a compound of formula (I) of claim 170, and
a pharmaceutically acceptable carrier.

267. A pharmaceutical composition comprising an anti-hypercholesterolemia effective amount of a compound of formula (I) of claim 170, and
a pharmaceutically acceptable carrier.

268. A method for the prophylaxis or treatment of a hyperlipidemic condition comprising administering to a patient in need thereof a composition of claim 265 in unit dosage form.

269. A method for the prophylaxis or treatment of an atherosclerotic condition comprising administering to a patient in need thereof a composition of claim 266 in unit dosage form.

270. A method for the prophylaxis or treatment of hypercholesterolemia comprising administering to a patient in need thereof a composition of claim 267 in unit dosage form.

271. A pharmaceutical composition comprising an anti-hyperlipidemic condition effective amount of a compound of formula (I) of claim 180, and
a pharmaceutically acceptable carrier.

272. A pharmaceutical composition comprising an anti-atherosclerotic effective amount of a compound of formula (I) of claim 180, and

a pharmaceutically acceptable carrier.

273. A pharmaceutical composition comprising an anti-hypercholesterolemia effective amount of a compound of formula (I) of claim 180, and
a pharmaceutically acceptable carrier.

274. A method for the prophylaxis or treatment of a hyperlipidemic condition comprising administering to a patient in need thereof a composition of claim 271 in unit dosage form.

275. A method for the prophylaxis or treatment of an atherosclerotic condition comprising administering to a patient in need thereof a composition of claim 272 in unit dosage form.

276. A method for the prophylaxis or treatment of hypercholesterolemia comprising administering to a patient in need thereof a composition of claim 273 in unit dosage form.

277. A pharmaceutical composition comprising an anti-hyperlipidemic condition effective amount of a compound of formula (I) of claim 201, and
a pharmaceutically acceptable carrier.

278. A pharmaceutical composition comprising an anti-atherosclerotic effective amount of a compound of formula (I) of claim 201, and
a pharmaceutically acceptable carrier.

279. A pharmaceutical composition comprising an anti-hypercholesterolemia effective amount of a compound of formula (I) of claim 201, and

a pharmaceutically acceptable carrier.

280. A method for the prophylaxis or treatment of a hyperlipidemic condition comprising administering to a patient in need thereof a composition of claim 277 in unit dosage form.

281. A method for the prophylaxis or treatment of an atherosclerotic condition comprising administering to a patient in need thereof a composition of claim 278 in unit dosage form.

282. A method for the prophylaxis or treatment of hypercholesterolemia comprising administering to a patient in need thereof a composition of claim 279 in unit dosage form.

283. A pharmaceutical composition comprising an anti-hyperlipidemic condition effective amount of a compound of formula (I) of claim 218, and
a pharmaceutically acceptable carrier.

284. A pharmaceutical composition comprising an anti-atherosclerotic effective amount of a compound of formula (I) of claim 218, and
a pharmaceutically acceptable carrier.

285. A pharmaceutical composition comprising an anti-hypercholesterolemia effective amount of a compound of formula (I) of claim 218, and
a pharmaceutically acceptable carrier.

286. A method for the prophylaxis or treatment of a hyperlipidemic condition comprising administering to a patient in need thereof a composition of claim 283 in

unit dosage form.

287. A method for the prophylaxis or treatment of an atherosclerotic condition comprising administering to a patient in need thereof a composition of claim 284 in unit dosage form.

288. A method for the prophylaxis or treatment of hypercholesterolemia comprising administering to a patient in need thereof a composition of claim 285 in unit dosage form.

289. A pharmaceutical composition comprising an anti-hyperlipidemic condition effective amount of a compound of formula (I) of claim 234, and
a pharmaceutically acceptable carrier.

290. A pharmaceutical composition comprising an anti-atherosclerotic effective amount of a compound of formula (I) of claim 234, and
a pharmaceutically acceptable carrier.

291. A pharmaceutical composition comprising an anti-hypercholesterolemia effective amount of a compound of formula (I) of claim 234, and
a pharmaceutically acceptable carrier.

292. A method for the prophylaxis or treatment of a hyperlipidemic condition comprising administering to a patient in need thereof a composition of claim 289 in unit dosage form.

293. A method for the prophylaxis or treatment of an atherosclerotic condition comprising administering to a patient in need thereof a composition of claim 290

in unit dosage form.

294. A method for the prophylaxis or treatment of hypercholesterolemia comprising administering to a patient in need thereof a composition of claim 291 in unit dosage form.

295. A pharmaceutical composition comprising an anti-hyperlipidemic condition effective amount of a compound of formula (I) of claim 249, and
a pharmaceutically acceptable carrier.

296. A pharmaceutical composition comprising an anti-atherosclerotic effective amount of a compound of formula (I) of claim 249, and
a pharmaceutically acceptable carrier.

297. A pharmaceutical composition comprising an anti-hypercholesterolemia effective amount of a compound of formula (I) of claim 249, and
a pharmaceutically acceptable carrier.

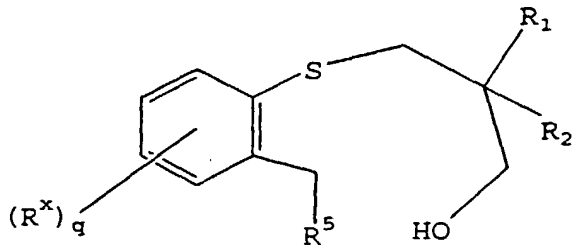
298. A method for the prophylaxis or treatment of a hyperlipidemic condition comprising administering to a patient in need thereof a composition of claim 295 in unit dosage form.

299. A method for the prophylaxis or treatment of an atherosclerotic condition comprising administering to a patient in need thereof a composition of claim 296 in unit dosage form.

300. A method for the prophylaxis or treatment of hypercholesterolemia comprising administering to a patient in need thereof a composition of claim 297 in

unit dosage form.

301. A process for the preparation of a compound having the formula:



XLI

comprising:

treating a thiophenol with an abstracting agent;

coupling the thiophenyl and a cyclic sulfate to form an intermediate comprising a sulfate group; and

removing the sulfate group of the intermediate to form the compound of formula XLI;

wherein

q is an integer from 1 to 4;

$R^1$ and $R^2$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkylamino, alkylthio, (polyalkyl)aryl, and cycloalkyl,

wherein alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkylamino, alkylthio, (polyalkyl)aryl, and cycloalkyl optionally are substituted with one or more substituents selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^+R^9R^{10}R^vA^-$, $SR^9$, $S^+R^9R^{10}A^-$, $P^+R^9R^{10}R^{11}A^-$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, $CO_2R^9$, CN, halogen, oxo, and $CONR^9R^{10}$,

wherein alkyl, alkenyl, alkynyl, alkylaryl, alkoxy, alkoxyalkyl, (polyalkyl)aryl, and cycloalkyl optionally have one or more carbons replaced by O, $NR^9$,

$N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $P^+R^9R^{10}A^-$, or phenylene,

wherein $R^9$, $R^{10}$, and $R^w$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, cycloalkyl, aryl, acyl, heterocycle, ammoniumalkyl, arylalkyl, carboxyalkyl, carboxyheteroaryl, carboxyheterocycle, carboalkoxyalkyl, carboxyalkylamino, heteroarylalkyl, heterocyclylalkyl, and alkylammoniumalkyl; or

$R^1$ and $R^2$ taken together with the carbon to which they are attached form $C_3$-$C_{10}$ cycloalkyl;

$R^3$ is hydroxy;

$R^4$ is hydrogen;

$R^5$ and $R^6$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, quaternary heterocycle, $OR^{30}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, and $SO_3R^9$,

wherein alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, quaternary heterocycle, and quaternary heteroaryl can be substituted with one or more substituent groups independently selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary heteroaryl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $NR^{13}C(O)R^{14}$, $NR^{13}C(O)NR^{14}R^{15}$, $NR^{13}CO_2R^{14}$, $OC(O)R^{13}$, $OC(O)NR^{13}R^{14}$, $NR^{13}SOR^{14}$, $NR^{13}SO_2R^{14}$, $NR^{13}SONR^{14}R^{15}$, $NR^{13}SO_2NR^{14}R^{15}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R^{15}A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$,

wherein:

$A^-$ is a pharmaceutically acceptable anion and M is

a pharmaceutically acceptable cation,

said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can be further substituted with one or more substituent groups selected from the group consisting of $OR^7$, $NR^7R^8$, $SR^7$, $S(O)R^7$, $SO_2R^7$, $SO_3R^7$, $CO_2R^7$, CN, oxo, $CONR^7R^8$, $N^+R^7R^8R^9A^-$, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary heteroaryl, $P(O)R^7R^8$, $P^+R^7R^8R^9A^-$, and $P(O)(OR^7)OR^8$, and

wherein said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can optionally have one or more carbons replaced by O, $NR^7$, $N^+R^7R^8A^-$, S, SO, $SO_2$, $S^+R^7A^-$, $PR^7$, $P(O)R^7$, $P^+R^7R^8A^-$, or phenylene, and $R^{13}$, $R^{14}$, and $R^{15}$ are independently selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, arylalkyl, alkylarylalkyl, alkylheteroarylalkyl, alkylheterocyclylalkyl, cycloalkyl, heterocycle, heteroaryl, quaternary heterocycle, quaternary heteroaryl, heterocyclylalkyl, heteroarylalkyl, quaternary heterocyclylalkyl, quaternary heteroarylalkyl, alkylammoniumalkyl, and carboxyalkylaminocarbonylalkyl,

wherein alkyl, alkenyl, alkynyl, arylalkyl, heterocycle, and polyalkyl optionally have one or more carbons replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $PR^9$, $P^+R^9R^{10}A^-$, $P(O)R^9$, phenylene, carbohydrate, amino acid, peptide, or polypeptide, and

$R^{13}$, $R^{14}$, and $R^{15}$ are optionally substituted with one or more groups selected from the group consisting

of hydroxy, amino, sulfo, carboxy, alkyl, carboxyalkyl, heterocycle, heteroaryl, sulfoalkyl, quaternary heterocycle, quaternary heteroaryl, quaternary heterocyclylalkyl, quaternary heteroarylalkyl, guanidinyl, $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{10}R^{11}A-$, $S^+R^9R^{10}A-$, and $C(O)OM$,

wherein $R^{16}$ and $R^{17}$ are independently selected from the substituents constituting $R^9$ and M; or

$R^{13}$ and $R^{14}$, together with the nitrogen atom to which they are attached form a mono- or polycyclic heterocycle that is optionally substituted with one or more radicals selected from the group consisting of oxo, carboxy and quaternary salts; or

$R^{14}$ and $R^{15}$, together with the nitrogen atom to which they are attached, form a cyclic ring; and

$R^{30}$ is selected from the group consisting of alkyl, alkenyl, alkynyl, cycloalkyl, aryl, acyl, heterocycle, ammoniumalkyl, alkylammoniumalkyl, arylalkyl, carboxyalkyl, carboxyheteroaryl, carboxyheterocycle, carboalkoxyalkyl, carboxyalkylamino, heteroarylalkyl, heterocyclylalkyl, and alkylammoniumalkyl; and

$R^7$ and $R^8$ are hydrogen; and

one or more $R^x$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, polyalkyl, acyloxy, aryl, arylalkyl, halogen, haloalkyl, cycloalkyl, heterocycle, heteroaryl, polyether, quaternary heterocycle, quaternary heteroaryl, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $S(O)_2R^{13}$, $SO_3R^{13}$, $S^+R^{13}R^{14}A^-$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, $C(O)NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, $C(O)OM$, $COR^{13}$, $OR^{18}$, $S(O)_nNR^{18}$, $NR^{13}R^{18}$, $NR^{18}OR^{14}$, $N^+R^9R^{11}R^{12}A^-$,

$P^+R^9R^{11}R^{12}A^-$, amino acid, peptide, polypeptide, and carbohydrate,

wherein alkyl, alkenyl, alkynyl, cycloalkyl, aryl, polyalkyl, heterocycle, acyloxy, arylalkyl, haloalkyl, polyether, quaternary heterocycle, and quaternary heteroaryl can be further substituted with $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{11}R^{12}A^-$, $S^+R^9R^{10}A^-$, or $C(O)OM$, and

wherein $R^{18}$ is selected from the group consisting of acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heteroaryl, and alkyl,

wherein acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heteroaryl, alkyl, quaternary heterocycle, and quaternary heteroaryl optionally are substituted with one or more substituents selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^-R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2R^9$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, and $C(O)OM$,

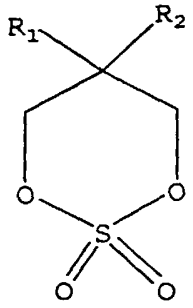
wherein in $R^x$, one or more carbons are optionally replaced by O, $NR^{13}$, $N^+R^{13}R^{14}A^-$, S, SO, $SO_2$, $S^+R^{13}A^-$, $PR^{13}$, $P(O)R^{13}$, $P^+R^{13}R^{14}A^-$, phenylene, amino acid, peptide, polypeptide, carbohydrate, polyether, or polyalkyl,

wherein in said polyalkyl, phenylene, amino acid, peptide, polypeptide, and carbohydrate, one or more carbons are optionally replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $PR^9$, $P^+R^9R^{10}A^-$, or $P(O)R^9$;

wherein quaternary heterocycle and quaternary heteroaryl are optionally substituted with one or more groups selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R^{15}A^-$,

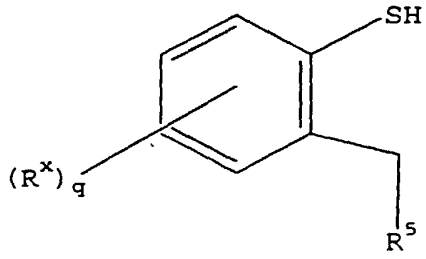
$P(OR^{13})OR^{14}$, $S^{+}R^{13}R^{14}A^{-}$, and $N^{+}R^{9}R^{11}R^{12}A^{-}$.

302. The process of claim 301 wherein the cyclic sulfate has the formula:



XL

and the thiophenol has the formula:



XVIIIA

wherein $R^1$, $R^2$, $R^5$, $R^x$ and q are as defined in claim 301.

303. The process of claim 301 wherein the sulfate group is removed by treating the intermediate with a hydrolyzing agent.

304. The process of claim 303 wherein the hydrolyzing agent is a mineral acid.

305. The process of claim 303 wherein the

hydrolyzing agent is selected from the group consisting of hydrochloric acid and sulfuric acid.

306. The process of claim 302 wherein the abstracting agent is a base having a pH of at least about 10.

307. The process of claim 302 wherein the abstracting agent is an alkali metal hydride.

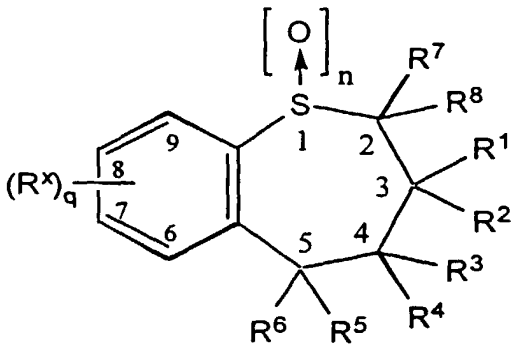
308. The process of claim 302 wherein the abstracting agent is sodium hydride.

309. The process of claim 302 wherein the $R^1$ and $R^2$ are alkyl.

310. The process of claim 302 wherein the $R^1$ and $R^2$ are selected from the group consisting of ethyl, n-butyl, iso-butyl and pentyl.

311. The process of claim 302 wherein the $R^1$ and $R^2$ are n-butyl.

312. A process for the preparation of a compound having the formula I:



(I

comprising:

reacting a cyclic sulfate with a thiophenol to form an alcohol;

oxidizing said alcohol to form a sulfone-aldehyde; and

cyclizing said sulfone-aldehyde to form the compound of formula I;

wherein:

q is an integer from 1 to 4;

n is 2;

$R^1$ and $R^2$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkylamino, alkylthio, (polyalkyl)aryl, and cycloalkyl,

wherein alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkylamino, alkylthio, (polyalkyl)aryl, and cycloalkyl optionally are substituted with one or more substituents selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^+R^9R^{10}R^wA^-$, $SR^9$, $S^+R^9R^{10}A^-$, $P^+R^9R^{10}R^{11}A^-$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, $CO_2R^9$, CN, halogen, oxo, and $CONR^9R^{10}$,

wherein alkyl, alkenyl, alkynyl, alkylaryl, alkoxy, alkoxyalkyl, (polyalkyl)aryl, and cycloalkyl optionally have one or more carbons replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $P^+R^9R^{10}A^-$, or phenylene,

wherein $R^9$, $R^{10}$, and $R^w$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, cycloalkyl, aryl, acyl, heterocycle, ammoniumalkyl, arylalkyl, carboxyalkyl, carboxyheteroaryl, carboxyheterocycle, carboalkoxyalkyl, carboxyalkylamino, heteroarylalkyl, heterocyclylalkyl, and alkylammoniumalkyl; or

$R^1$ and $R^2$ taken together with the carbon to which they are attached form $C_3$-$C_{10}$ cycloalkyl;

$R^3$ is hydroxy;

$R^4$ is hydrogen;

$R^5$ and $R^6$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, quaternary heterocycle, $OR^{30}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, and $SO_3R^9$,

wherein alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, quaternary heterocycle, and quaternary heteroaryl can be substituted with one or more substituent groups independently selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary heteroaryl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $NR^{13}C(O)R^{14}$, $NR^{13}C(O)NR^{14}R^{15}$, $NR^{13}CO_2R^{14}$, $OC(O)R^{13}$, $OC(O)NR^{13}R^{14}$, $NR^{13}SOR^{14}$, $NR^{13}SO_2R^{14}$, $NR^{13}SONR^{14}R^{15}$, $NR^{13}SO_2NR^{14}R^{15}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R^{15}A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$,

wherein:

$A^-$ is a pharmaceutically acceptable anion and M is a pharmaceutically acceptable cation,

said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can be further substituted with one or more substituent groups selected from the group consisting of $OR^7$, $NR^7R^8$, $SR^7$, $S(O)R^7$, $SO_2R^7$, $SO_3R^7$, $CO_2R^7$, CN, oxo, $CONR^7R^8$, $N^+R^7R^8R^9A-$, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary heteroaryl, $P(O)R^7R^8$,

$P^+R^7R^8R^9A^-$, and $P(O)(OR^7)OR^8$, and

wherein said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can optionally have one or more carbons replaced by O, $NR^7$, $N^+R^7R^8A^-$, S, SO, $SO_2$, $S^+R^7A^-$, $PR^7$, $P(O)R^7$, $P^+R^7R^8A^-$, or phenylene, and $R^{13}$, $R^{14}$, and $R^{15}$ are independently selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, arylalkyl, alkylarylalkyl, alkylheteroarylalkyl, alkylheterocyclylalkyl, cycloalkyl, heterocycle, heteroaryl, quaternary heterocycle, quaternary heteroaryl, heterocyclylalkyl, heteroarylalkyl, quaternary heterocyclylalkyl, quaternary heteroarylalkyl, alkylammoniumalkyl, and carboxyalkylaminocarbonylalkyl,

wherein alkyl, alkenyl, alkynyl, arylalkyl, heterocycle, and polyalkyl optionally have one or more carbons replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $PR^9$, $P^+R^9R^{10}A^-$, $P(O)R^9$, phenylene, carbohydrate, amino acid, peptide, or polypeptide, and

$R^{13}$, $R^{14}$, and $R^{15}$ are optionally substituted with one or more groups selected from the group consisting of hydroxy, amino, sulfo, carboxy, alkyl, carboxyalkyl, heterocycle, heteroaryl, sulfoalkyl, quaternary heterocycle, quaternary heteroaryl, quaternary heterocyclylalkyl, quaternary heteroarylalkyl, guanidinyl, $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{10}R^{11}A^-$, $S^+R^9R^{10}A^-$, and $C(O)OM$,

wherein $R^{16}$ and $R^{17}$ are independently selected

from the substituents constituting $R^9$ and M; or

$R^{13}$ and $R^{14}$, together with the nitrogen atom to which they are attached form a mono-, or polycyclic heterocycle that is optionally substituted with one or more radicals selected from the group consisting of oxo, carboxy and quaternary salts; or

$R^{14}$ and $R^{15}$, together with the nitrogen atom to which they are attached, form a cyclic ring; and

$R^{30}$ is selected from the group consisting of alkyl, alkenyl, alkynyl, cycloalkyl, aryl, acyl, heterocycle, ammoniumalkyl, alkylammoniumalkyl, arylalkyl, carboxyalkyl, carboxyheteroaryl, carboxyheterocycle, carboalkoxyalkyl, carboxyalkylamino, heteroarylalkyl, heterocyclylalkyl, and alkylammoniumalkyl; and

$R^7$ and $R^8$ are hydrogen; and

one or more $R^x$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, polyalkyl, acyloxy, aryl, arylalkyl, halogen, haloalkyl, cycloalkyl, heterocycle, heteroaryl, polyether, quaternary heterocycle, quaternary heteroaryl, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $S(O)_2R^{13}$, $SO_3R^{13}$, $S^+R^{13}R^{14}A^-$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, $C(O)NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, C(O)OM, $COR^{13}$, $OR^{18}$, $S(O)_nNR^{18}$, $NR^{13}R^{18}$, $NR^{18}OR^{14}$, $N^+R^9R^{11}R^{12}A^-$, $P^+R^9R^{11}R^{12}A^-$, amino acid, peptide, polypeptide, and carbohydrate,

wherein alkyl, alkenyl, alkynyl, cycloalkyl, aryl, polyalkyl, heterocycle, acyloxy, arylalkyl, haloalkyl, polyether, quaternary heterocycle, and quaternary heteroaryl can be further substituted with $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{11}R^{12}A^-$, $S^+R^9R^{10}A^-$, or C(O)OM, and

wherein $R^{18}$ is selected from the group consisting

of acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heteroaryl, and alkyl,

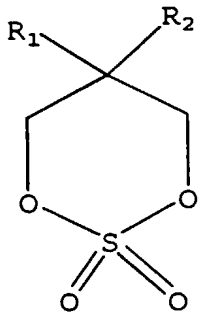
wherein acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heteroaryl, alkyl, quaternary heterocycle, and quaternary heteroaryl optionally are substituted with one or more substituents selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_3R^9$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, and $C(O)OM$,

wherein in $R^x$, one or more carbons are optionally replaced by O, $NR^{13}$, $N^+R^{13}R^{14}A^-$, S, SO, $SO_2$, $S^+R^{13}A^-$, $PR^{13}$, $P(O)R^{13}$, $P^+R^{13}R^{14}A^-$, phenylene, amino acid, peptide, polypeptide, carbohydrate, polyether, or polyalkyl,

wherein in said polyalkyl, phenylene, amino acid, peptide, polypeptide, and carbohydrate, one or more carbons are optionally replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $PR^9$, $P^+R^9R^{10}A^-$, or $P(O)R^9$;

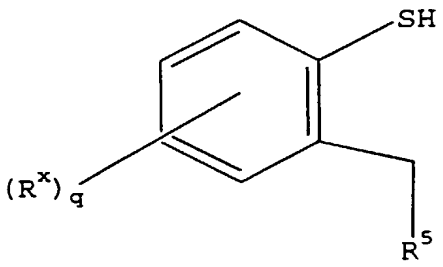
wherein quaternary heterocycle and quaternary heteroaryl are optionally substituted with one or more groups selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R^{15}A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$.

313. The process of claim 312 wherein the cyclic sulfate has the formula:



XL

and the thiophenol has the formula:



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wherein $R^1$, $R^2$, $R^5$, $R^x$ and q are as defined in claim 312.

314. The process of claim 313 wherein the $R^1$ and $R^2$ are alkyl.

315. The process of claim 313 wherein the $R^1$ and $R^2$ are selected from the group consisting of ethyl, n-butyl, iso-butyl and pentyl.

316. The process of claim 313 wherein the $R^1$ and $R^2$ are n-butyl.

317. The process of claim 313 wherein the alcohol is oxidized with an oxidizing agent to form an

aldehyde.

318. The process of claim 317 wherein the aldehyde is oxidized with an oxidizing agent to form a sulfone-aldehyde.

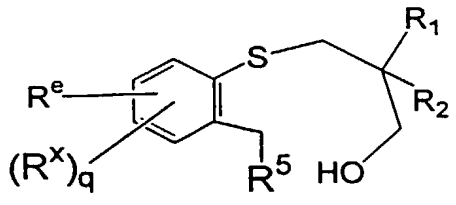
319. The process of claim 313 wherein the sulfone-aldehyde is cyclized with a cyclizing agent that is a base having a pH between about 8 to about 9.

320. The process of claim 313 wherein the sulfone-aldehyde is cyclized with a cyclizing agent that is an alkali alkoxide base.

321. The process of claim 313 wherein the sulfone-aldehyde is cyclized with potassium tert-butoxide.

322. The process of claim 313 wherein the alcohol is oxidized with pyridinium chlorochromate to form an aldehyde; the aldehyde is oxidized with metachloroperbenzoic acid to form a sulfone-aldehyde; and the sulfone-aldehyde is cyclized with potassium tert-butoxide.

323. A process for the preparation of a compound having the formula LI:




LI

comprising:

treating a halobenzene with an abstracting agent;

coupling the halobenzene and a cyclic sulfate to form an intermediate comprising a sulfate group; and

removing the sulfate group of the intermediate to form the compound of formula LI; wherein

q is an integer from 1 to 4;

$R^1$ and $R^2$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkylamino, alkylthio, (polyalkyl)aryl, and cycloalkyl,

wherein alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkylamino, alkylthio, (polyalkyl)aryl, and cycloalkyl optionally are substituted with one or more substituents selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^+R^9R^{10}R^wA^-$, $SR^9$, $S^+R^9R^{10}A^-$, $P^+R^9R^{10}R^{11}A^-$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, $CO_2R^9$, CN, halogen, oxo, and $CONR^9R^{10}$,

wherein alkyl, alkenyl, alkynyl, alkylaryl, alkoxy, alkoxyalkyl, (polyalkyl)aryl, and cycloalkyl optionally have one or more carbons replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $P^+R^9R^{10}A^-$, or phenylene,

wherein $R^9$, $R^{10}$, and $R^w$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, cycloalkyl, aryl, acyl, heterocycle, ammoniumalkyl, arylalkyl, carboxyalkyl, carboxyheteroaryl, carboxyheterocycle, carboalkoxyalkyl, carboxyalkylamino, heteroarylalkyl, heterocyclylalkyl, and alkylammoniumalkyl; or

$R^1$ and $R^2$ taken together with the carbon to which they are attached form $C_3$-$C_{10}$ cycloalkyl;

$R^3$ is hydroxy;

$R^4$ is hydrogen;

$R^5$ and $R^6$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, aryl,

cycloalkyl, heterocycle, quaternary heterocycle, $OR^{30}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, and $SO_3R^9$,

wherein alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, quaternary heterocycle, and quaternary heteroaryl can be substituted with one or more substituent groups independently selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary heteroaryl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $NR^{13}C(O)R^{14}$, $NR^{13}C(O)NR^{14}R^{15}$, $NR^{13}CO_2R^{14}$, $OC(O)R^{13}$, $OC(O)NR^{13}R^{14}$, $NR^{13}SOR^{14}$, $NR^{13}SO_2R^{14}$, $NR^{13}SONR^{14}R^{15}$, $NR^{13}SO_2NR^{14}R^{15}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R^{15}A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$,

wherein:

$A^-$ is a pharmaceutically acceptable anion and M is a pharmaceutically acceptable cation,

said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can be further substituted with one or more substituent groups selected from the group consisting of $OR^7$, $NR^7R^8$, $SR^7$, $S(O)R^7$, $SO_2R^7$, $SO_3R^7$, $CO_2R^7$, CN, oxo, $CONR^7R^8$, $N^+R^7R^8R^9A-$, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary heteroaryl, $P(O)R^7R^8$, $P^+R^7R^8R^9A^-$, and $P(O)(OR^7)OR^8$, and

wherein said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle

can optionally have one or more carbons replaced by O, $NR^7$, $N^+R^7R^8A^-$, S, SO, $SO_2$, $S^+R^7A^-$, $PR^7$, $P(O)R^7$, $P^+R^7R^8A^-$, or phenylene, and $R^{13}$, $R^{14}$, and $R^{15}$ are independently selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, arylalkyl, alkylarylalkyl, alkylheteroarylalkyl, alkylheterocyclylalkyl, cycloalkyl, heterocycle, heteroaryl, quaternary heterocycle, quaternary heteroaryl, heterocyclylalkyl, heteroarylalkyl, quaternary heterocyclylalkyl, quaternary heteroarylalkyl, alkylammoniumalkyl, and carboxyalkylaminocarbonylalkyl,

wherein alkyl, alkenyl, alkynyl, arylalkyl, heterocycle, and polyalkyl optionally have one or more carbons replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $PR^9$, $P^+R^9R^{10}A^-$, $P(O)R^9$, phenylene, carbohydrate, amino acid, peptide, or polypeptide, and

$R^{13}$, $R^{14}$, and $R^{15}$ are optionally substituted with one or more groups selected from the group consisting of hydroxy, amino, sulfo, carboxy, alkyl, carboxyalkyl, heterocycle, heteroaryl, sulfoalkyl, quaternary heterocycle, quaternary heteroaryl, quaternary heterocyclylalkyl, quaternary heteroarylalkyl, guanidinyl, $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{10}R^{11}A^-$, $S^+R^9R^{10}A^-$, and $C(O)OM$,

wherein $R^{16}$ and $R^{17}$ are independently selected from the substituents constituting $R^9$ and M; or

$R^{13}$ and $R^{14}$, together with the nitrogen atom to which they are attached form a mono- or polycyclic

heterocycle that is optionally substituted with one or more radicals selected from the group consisting of oxo, carboxy and quaternary salts; or

$R^{14}$ and $R^{15}$, together with the nitrogen atom to which they are attached, form a cyclic ring; and

$R^{30}$ is selected from the group consisting of alkyl, alkenyl, alkynyl, cycloalkyl, aryl, acyl, heterocycle, ammoniumalkyl, alkylammoniumalkyl, arylalkyl, carboxyalkyl, carboxyheteroaryl, carboxyheterocycle, carboalkoxyalkyl, carboxyalkylamino, heteroarylalkyl, heterocyclylalkyl, and alkylammoniumalkyl; and

$R^7$ and $R^8$ are hydrogen; and

one or more $R^x$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, polyalkyl, acyloxy, aryl, arylalkyl, halogen, haloalkyl, cycloalkyl, heterocycle, heteroaryl, polyether, quaternary heterocycle, quaternary heteroaryl, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $S(O)_2R^{13}$, $SO_3R^{13}$, $S^+R^{13}R^{14}A^-$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, $C(O)NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, C(O)OM, $COR^{13}$, $OR^{18}$, $S(O)_nNR^{18}$, $NR^{13}R^{18}$, $NR^{18}OR^{14}$, $N^+R^9R^{11}R^{12}A^-$, $P^+R^9R^{11}R^{12}A^-$, amino acid, peptide, polypeptide, and carbohydrate,

wherein alkyl, alkenyl, alkynyl, cycloalkyl, aryl, polyalkyl, heterocycle, acyloxy, arylalkyl, haloalkyl, polyether, quaternary heterocycle, and quaternary heteroaryl can be further substituted with $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{11}R^{12}A^-$, $S^+R^9R^{10}A^-$, or C(O)OM, and

wherein $R^{18}$ is selected from the group consisting of acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heteroaryl, and alkyl,

wherein acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heteroaryl, alkyl, quaternary heterocycle,

and quaternary heteroaryl optionally are substituted with one or more substituents selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_3R^9$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, and $C(O)OM$,

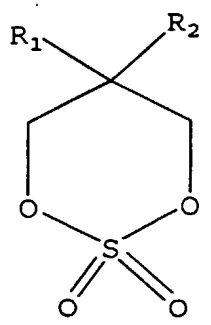
wherein in $R^x$, one or more carbons are optionally replaced by O, $NR^{13}$, $N^+R^{13}R^{14}A^-$, S, SO, $SO_2$, $S^+R^{13}A^-$, $PR^{13}$, $P(O)R^{13}$, $P^+R^{13}R^{14}A^-$, phenylene, amino acid, peptide, polypeptide, carbohydrate, polyether, or polyalkyl,

wherein in said polyalkyl, phenylene, amino acid, peptide, polypeptide, and carbohydrate, one or more carbons are optionally replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $PR^9$, $P^+R^9R^{10}A^-$, or $P(O)R^9$;

wherein quaternary heterocycle and quaternary heteroaryl are optionally substituted with one or more groups selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R^{15}A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$; and

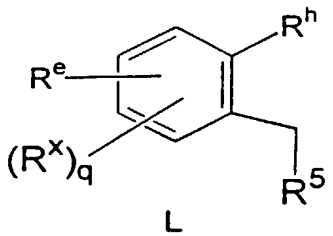
$R^e$ is an electron-withdrawing group located at the para or ortho position.

324. The process of claim 323 wherein the cyclic sulfate has the formula:



XL

and the halobenzene has the formula:



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wherein $R^h$ is halogen, and $R^1$, $R^2$, $R^5$, $R^x$, $R^e$ and q are as defined in claim 323.

325. The process of claim 324 wherein the sulfate group is removed by treating the intermediate with a hydrolyzing agent.

326. The process of claim 325 wherein the hydrolyzing agent is a mineral acid.

327. The process of claim 325 wherein the hydrolyzing agent is selected from the group consisting of hydrochloric acid and sulfuric acid.

328. The process of claim 324 wherein the abstracting agent is a dialkali metal sulfide.

329. The process of claim 324 wherein the abstracting agent is dilithium sulfide.

330. The process of claim 324 wherein $R^1$ and $R^2$ are alkyl.

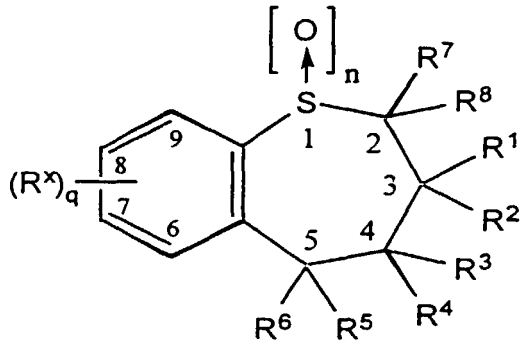
331. The process of claim 324 wherein $R^1$ and $R^2$ are selected from the group consisting of ethyl, n-butyl, iso-butyl and pentyl.

332. The process of claim 324 wherein $R^1$ and $R^2$ are n-butyl.

333. The process of claim 324 wherein $R^h$ is chloro.

334. The process of claim 324 wherein $R^e$ is p-nitro.

335. A process for the preparation of a compound having the formula I:



(I

comprising:

reacting a cyclic sulfate with a halobenzene to form an alcohol;

oxidizing said alcohol to form a sulfone-aldehyde; and

cyclizing said sulfone-aldehyde to form the compound of formula I;

wherein

q is an integer from 1 to 4;

n is 2;

$R^1$ and $R^2$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkylamino, alkylthio, (polyalkyl)aryl, and cycloalkyl,

wherein alkyl, alkenyl, alkynyl, haloalkyl, alkylaryl, arylalkyl, alkoxy, alkoxyalkyl, dialkylamino, alkylthio, (polyalkyl)aryl, and cycloalkyl optionally are substituted with one or more substituents selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^-R^9R^{10}R^vA^-$, $SR^9$, $S^+R^9R^{10}A^-$, $P^+R^9R^{10}R^{11}A^-$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, $CO_2R^9$, CN, halogen, oxo, and $CONR^9R^{10}$,

wherein alkyl, alkenyl, alkynyl, alkylaryl, alkoxy, alkoxyalkyl, (polyalkyl)aryl, and cycloalkyl optionally have one or more carbons replaced by O, $NR^9$, $N^+R^9R^{10}A^-$, S, SO, $SO_2$, $S^+R^9A^-$, $P^+R^9R^{10}A^-$, or phenylene,

wherein $R^9$, $R^{10}$, and $R^v$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, cycloalkyl, aryl, acyl, heterocycle, ammoniumalkyl, arylalkyl, carboxyalkyl, carboxyheteroaryl, carboxyheterocycle, carboalkoxyalkyl, carboxyalkylamino, heteroarylalkyl, heterocyclylalkyl, and alkylammoniumalkyl; or

$R^1$ and $R^2$ taken together with the carbon to which they are attached form $C_3$-$C_{10}$ cycloalkyl;

$R^3$ is hydroxy;

$R^4$ is hydrogen;

$R^5$ and $R^6$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, quaternary heterocycle, $OR^{30}$, $SR^9$, $S(O)R^9$, $SO_2R^9$, and $SO_3R^9$,

wherein alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, quaternary heterocycle, and quaternary heteroaryl can be substituted with one or more substituent groups independently selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary heteroaryl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, $C(O)OM$, $COR^{13}$, $NR^{13}C(O)R^{14}$, $NR^{13}C(O)NR^{14}R^{15}$, $NR^{13}CO_2R^{14}$, $OC(O)R^{13}$, $OC(O)NR^{13}R^{14}$, $NR^{13}SOR^{14}$, $NR^{13}SO_2R^{14}$, $NR^{13}SONR^{14}R^{15}$, $NR^{13}SO_2NR^{14}R^{15}$, $P(O)R^{13}R^{14}$, $P^+R^{13}R^{14}R^{15}A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$,

wherein:

$A^-$ is a pharmaceutically acceptable anion and M is a pharmaceutically acceptable cation,

said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can be further substituted with one or more substituent groups selected from the group consisting of $OR^7$, $NR^7R^8$, $SR^7$, $S(O)R^7$, $SO_2R^7$, $SO_3R^7$, $CO_2R^7$, CN, oxo, $CONR^7R^8$, $N^+R^7R^8R^9A-$, alkyl, alkenyl, alkynyl, aryl, cycloalkyl, heterocycle, arylalkyl, quaternary heterocycle, quaternary heteroaryl, $P(O)R^7R^8$, $P^+R^7R^8R^9A^-$, and $P(O)(OR^7)OR^8$, and

wherein said alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, and heterocycle can optionally have one or more carbons replaced by O, $NR^7$, $N^+R^7R^8A-$, S, SO, $SO_2$, $S^+R^7A-$, $PR^7$, $P(O)R^7$,

$P^+R^7R^8A-$, or phenylene, and $R^{13}$, $R^{14}$, and $R^{15}$ are independently selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, arylalkyl, alkylarylalkyl, alkylheteroarylalkyl, alkylheterocyclylalkyl, cycloalkyl, heterocycle, heteroaryl, quaternary heterocycle, quaternary heteroaryl, heterocyclylalkyl, heteroarylalkyl, quaternary heterocyclylalkyl, quaternary heteroarylalkyl, alkylammoniumalkyl, and carboxyalkylaminocarbonylalkyl,

wherein alkyl, alkenyl, alkynyl, arylalkyl, heterocycle, and polyalkyl optionally have one or more carbons replaced by O, $NR^9$, $N^+R^9R^{10}A-$, S, SO, $SO_2$, $S^+R^9A^-$, $PR^9$, $P^+R^9R^{10}A-$, $P(O)R^9$, phenylene, carbohydrate, amino acid, peptide, or polypeptide, and

$R^{13}$, $R^{14}$, and $R^{15}$ are optionally substituted with one or more groups selected from the group consisting of hydroxy, amino, sulfo, carboxy, alkyl, carboxyalkyl, heterocycle, heteroaryl, sulfoalkyl, quaternary heterocycle, quaternary heteroaryl, quaternary heterocyclylalkyl, quaternary heteroarylalkyl, guanidinyl, $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{10}R^{11}A-$, $S^+R^9R^{10}A-$, and $C(O)OM$,

wherein $R^{16}$ and $R^{17}$ are independently selected from the substituents constituting $R^9$ and M; or

$R^{13}$ and $R^{14}$, together with the nitrogen atom to which they are attached form a mono- or polycyclic heterocycle that is optionally substituted with one or more radicals selected from the group consisting of oxo, carboxy and quaternary salts; or

$R^{14}$ and $R^{15}$, together with the nitrogen atom to which they are attached, form a cyclic ring; and

$R^{30}$ is selected from the group consisting of alkyl, alkenyl, alkynyl, cycloalkyl, aryl, acyl, heterocycle, ammoniumalkyl, alkylammoniumalkyl, arylalkyl, carboxyalkyl, carboxyheteroaryl, carboxyheterocycle, carboalkoxyalkyl, carboxyalkylamino, heteroarylalkyl, heterocyclylalkyl, and alkylammoniumalkyl; and

$R^7$ and $R^8$ are hydrogen; and

one or more $R^x$ are independently selected from the group consisting of H, alkyl, alkenyl, alkynyl, polyalkyl, acyloxy, aryl, arylalkyl, halogen, haloalkyl, cycloalkyl, heterocycle, heteroaryl, polyether, quaternary heterocycle, quaternary heteroaryl, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $S(O)_2R^{13}$, $SO_3R^{13}$, $S^+R^{13}R^{14}A^-$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, $C(O)NR^{13}R^{14}$, $NR^{14}C(O)R^{13}$, C(O)OM, $COR^{13}$, $OR^{18}$, $S(O)_nNR^{18}$, $NR^{13}R^{18}$, $NR^{18}OR^{14}$, $N^-R^9R^{11}R^{12}A^-$, $P^+R^9R^{11}R^{12}A^-$, amino acid, peptide, polypeptide, and carbohydrate,

wherein alkyl, alkenyl, alkynyl, cycloalkyl, aryl, polyalkyl, heterocycle, acyloxy, arylalkyl, haloalkyl, polyether, quaternary heterocycle, and quaternary heteroaryl can be further substituted with $OR^9$, $NR^9R^{10}$, $N^+R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R$, $SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, $P^+R^9R^{11}R^{12}A^-$, $S^+R^9R^{10}A^-$, or C(O)OM, and

wherein $R^{18}$ is selected from the group consisting of acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heteroaryl, and alkyl,

wherein acyl, arylalkoxycarbonyl, arylalkyl, heterocycle, heteroaryl, alkyl, quaternary heterocycle, and quaternary heteroaryl optionally are substituted with one or more substituents selected from the group consisting of $OR^9$, $NR^9R^{10}$, $N^-R^9R^{11}R^{12}A^-$, $SR^9$, $S(O)R^9$, $SO_2R^9$,

$SO_3R^9$, oxo, $CO_2R^9$, CN, halogen, $CONR^9R^{10}$, $SO_3R^9$, $SO_2OM$, $SO_2NR^9R^{10}$, $PO(OR^{16})OR^{17}$, and C(O)OM,

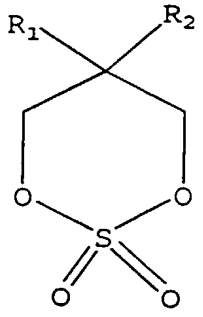
wherein in $R^x$, one or more carbons are optionally replaced by O, $NR^{13}$, $N^+R^{13}R^{14}A^-$, S, SO, $SO_2$, $S^+R^{13}A^-$, $PR^{13}$, $P(O)R^{13}$, $P^+R^{13}R^{14}A^-$, phenylene, amino acid, peptide, polypeptide, carbohydrate, polyether, or polyalkyl,

wherein in said polyalkyl, phenylene, amino acid, peptide, polypeptide, and carbohydrate, one or more carbons are optionally replaced by O, $NR^9$, $N^-R^9R^{10}A^-$, S, SO, $SO_2$, $S^-R^9A^-$, $PR^9$, $P^+R^9R^{10}A^-$, or $P(O)R^9$;

wherein quaternary heterocycle and quaternary heteroaryl are optionally substituted with one or more groups selected from the group consisting of alkyl, alkenyl, alkynyl, polyalkyl, polyether, aryl, haloalkyl, cycloalkyl, heterocycle, arylalkyl, halogen, oxo, $OR^{13}$, $NR^{13}R^{14}$, $SR^{13}$, $S(O)R^{13}$, $SO_2R^{13}$, $SO_3R^{13}$, $NR^{13}OR^{14}$, $NR^{13}NR^{14}R^{15}$, $NO_2$, $CO_2R^{13}$, CN, OM, $SO_2OM$, $SO_2NR^{13}R^{14}$, $C(O)NR^{13}R^{14}$, C(O)OM, $COR^{13}$, $P(O)R^{13}R^{14}$, $P^-R^{13}R^{14}R^{15}A^-$, $P(OR^{13})OR^{14}$, $S^+R^{13}R^{14}A^-$, and $N^+R^9R^{11}R^{12}A^-$; and

$R^e$ is an electron-withdrawing group located at the para or ortho position.

336. The process of claim 335 wherein the cyclic sulfate has the formula:

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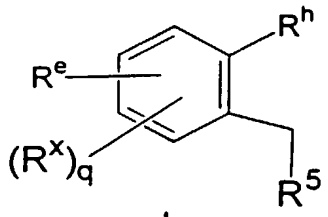
and the halobenzene has the formula:



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wherein $R^1$, $R^2$, $R^5$, $R^x$ and $R^e$ are as defined in claim 335, and $R^h$ is halogen.

337. The process of claim 336 wherein the sulfate group is removed by treating the intermediate with a hydrolyzing agent.

338. The process of claim 337 wherein the hydrolyzing agent is a mineral acid.

339. The process of claim 336 wherein the hydrolyzing agent is selected from the group consisting of hydrochloric acid and sulfuric acid.

340. The process of claim 336 wherein the abstracting agent is a dialkali metal sulfide.

341. The process of claim 336 wherein the abstracting agent is dilithium sulfide.

342. The process of claim 336 wherein $R^1$ and $R^2$ are alkyl.

343. The process of claim 336 wherein $R^1$ and $R^2$ are selected from the group consisting of ethyl, n-butyl, iso-butyl and pentyl.

344. The process of claim 336 wherein $R^1$ and $R^2$ are n-butyl.

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345. The process of claim 336 wherein $R^h$ is chloro.

346. The process of claim 336 wherein $R^e$ is p-nitro.

347. The process of claim 336 wherein the alcohol is oxidized with an oxidizing agent to form a sulfone.

348. The process of claim 336 wherein the sulfone is oxidized with an oxidizing agent to form a sulfone-aldehyde.

349. The process of claim 336 wherein the sulfone-aldehyde is cyclized with a cyclizing agent that is a base having a pH between about 8 to about 9.

350. The process of claim 336 wherein the sulfone-aldehyde is cyclized with a cyclizing agent that is an alkali alkoxide base.

351. The process of claim 336 wherein the sulfone-aldehyde is cyclized with potassium tert-butoxide.

352. The process of claim 336 wherein the alcohol is oxidized with metachloroperbenzoic acid to form a sulfone; the aldehyde is oxidized with pyridinium chlorochromate to form a sulfone-aldehyde; and the sulfone-aldehyde is cyclized with potassium tert-butoxide.